AUGUST 2, 1954 NEWS ISSUE

# Electrical World

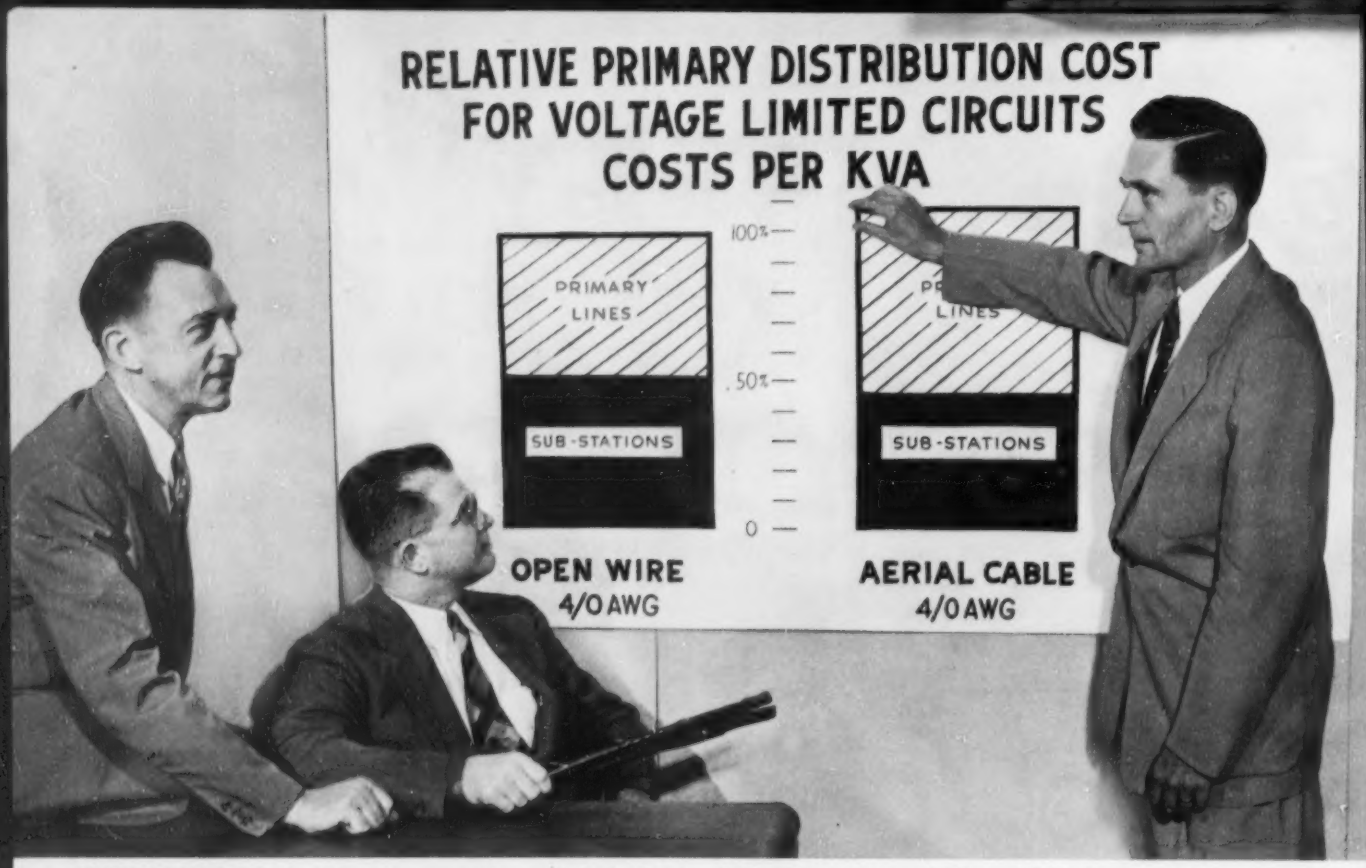
Price 35 Cents A McGRAW-HILL PUBLICATION

## *In Reading, Pa., a new operations center . . .*

## *—underneath it all, a heat pump*

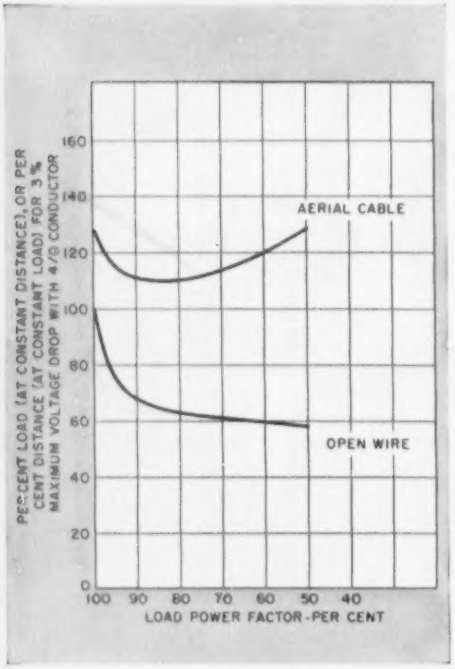
*For the latest details on rate decisions by regulatory agencies see page 62*

E P POWER
UNIVERSITY MICROFILMS IN
ANN ARBOR MICH




**COMPARATIVE COSTS** of aerial cable vs. open-wire on the basis of cost per kva of load area coverage are discussed by F. C. Van Wormer (left), electric utility engineer, and Wire and Cable Department's Manager Electric Utility Sales, W.G. Short and commercial engineer A. R. Lee (right)—all of G.E.

# It's time to take a new look at aerial cable




**EXTRA LOAD CARRYING ABILITY** of aerial cable over that of open-wire circuits is shown in this comparison at 4.16 kv, of 4/0 aerial cable and 4/0 open-wire, over a fixed distance, limited to 3% voltage drop.

## New study shows aerial cable only 3 to 12% more than open wire not counting greater reliability and improved appearance

A new evaluation, on the basis of dollars per kva of load area coverage instead of the cost per mile of line, shows aerial cable costs only 3 to 12% more than open wire.

### CARRIES EXTRA LOAD

Greater load carrying capacity within allowable voltage drop offsets much of the additional cost of aerial cable when voltage is the limiting factor. The close grouping of conductors in aerial cable results in a major reduction of line impedance and consequently voltage drop. This saving, plus the heavier substation loading possible, offsets the major portion of the extra cost per foot of preassembled aerial cable, with a resulting cost only 3 to 12% greater than open-wire.

### GREATER RELIABILITY

Additional savings not considered in this analysis also can be credited to the aerial cable installation when the reduced tree trimming, maintenance and outage revenue losses are capitalized. Aerial cable distribution is less vulnerable to damage by the elements than open-wire, and also provides a neater appearance—often important from a customer relations standpoint.

Working closely with electric utilities, General Electric has helped develop new types of aerial cable including preassembled construction and improved butyl insulation as used in Super Coronol* cables.

In this economic evaluation of the use of aerial cable on a systems basis, G.E. continues to assist the industry in finding new solutions to distribution problems.

Further information is contained in "The Economic Performance of Aerial Cable for Distribution Systems," which may be obtained by writing General Electric Company, Section 301-261, Schenectady 5, N.Y.

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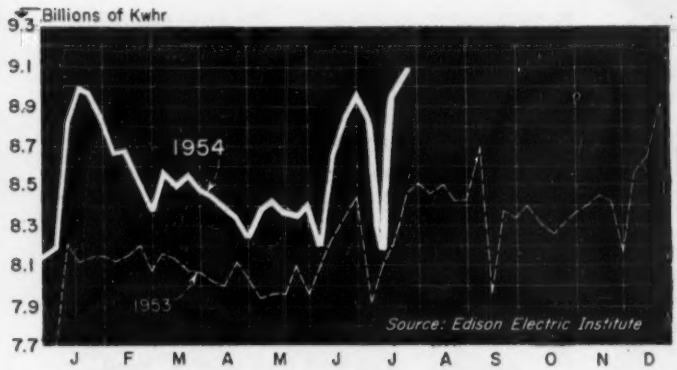
GENERAL ELECTRIC

# Electrical World

Published for 80 years for those engaged in the business of generating, transmitting, distributing, or applying electric power

August 2, 1954 Vol. 142, No. 5




## Output Week Ended July 24—9,103,000,000 Kwhr

Seasonally Adjusted Index†—178.1

Per Cent Change From Previous Year

| | Total US | New Eng. | Mid. Atlan. | Cent. Ind. | West Cent. | South-east | South Cent. | Rocky Mount. | Pacific NW | Pacific SW |
|---|---|---|---|---|---|---|---|---|---|---|
| July 24 | +7.6 | 0.0 | −1.7 | −2.1 | +14.3 | +18.6 | +23.8 | +3.4 | +1.6 | +4.2 |
| July 17 | +9.0 | −0.2 | −0.3 | −1.6 | +16.1 | +20.7 | +28.7 | +6.1 | +3.4 | +3.8 |
| July 10 | +1.1 | −5.1 | −7.8 | −9.8 | +7.6 | +13.2 | +9.1 | +4.8 | −1.1 | −0.9 |

## Electric Power Statistics

| | | Latest Month | Preceding Month | Year Ago |
|---|---|---|---|---|
| Peak Load‡ (Million Kw) | May | 73.8 | 73.7 | 70.7 |
| Capacity (Million Kw) | May | 93.81 | 93.56 | 84.34 |
| Production (Billion Kwhr) | May | 37.43 | 36.84 | 36.02 |
| Hydro | May | 10.35 | 9.91 | 10.29 |
| Fuel | May | 27.08 | 26.93 | 25.73 |
| Fuel Consumption | | | | |
| Coal (Million Tons) | May | 8.67 | 8.68 | 8.59 |
| Oil (Million Barrels) | May | 4.25 | 4.78 | 6.08 |
| Gas (Billion Cu Ft) | May | 94.70 | 91.10 | 87.72 |
| Sales (Billion Kwhr) | May | 31.59 | 32.31 | 31.32 |
| Residential | May | 9.31 | 9.93 | 8.50 |
| Commercial | May | 5.62 | 5.62 | 5.18 |
| Industrial | May | 14.43 | 14.60 | 15.49 |
| Other | May | 2.23 | 2.17 | 2.16 |
| Net Income Class A & B Companies ($ Million) | May | 85.46 | 96.05 | 82.58 |
| Estimated Dec. '54 Peak ‡(Million Kw) | May | 88.1 | 88.4 | 91.8 |
| Kwhr per Residential Customer (12 Month Average) | Apr. | 2,415 | 2,398 | 2,226 |
| Revenue per Kwhr Residential Service (12 Month Average) | Apr. | 2.72¢ | 2.72¢ | 2.76¢ |
| Canadian Production (Billion Kwhr) | May | 5.93 | 5.65 | 5.76 |

## Business Statistics

| | | | | |
|---|---|---|---|---|
| FRB Industrial Production Index† | June | 124* | 123 | 136 |
| Gross National Product Annual Rate ($ Billion) | 1stQtr | 355.8** | 360.5** | 361.8** |
| EW 4 Industry Production Index† | May | 114.9 | 114.6** | 126.2 |
| ENR Construction Cost Index†† | July | 135.0 | 130.5 | 126.6 |
| BLS Consumer's Price Index | June | 115.1 | 115.0 | 114.5 |
| NEMA Insulation Materials Sales Index† | May | 116 | 124 | 174 |
| NEMA Electric Appliance Sales Index† | May | 88 | 96 | 108 |
| NEMA Household Refrig. Sales Index† | May | 74 | 73 | 81 |

*Preliminary **Revised ‡Class 1 Systems †1947-49=100 ††1949=100

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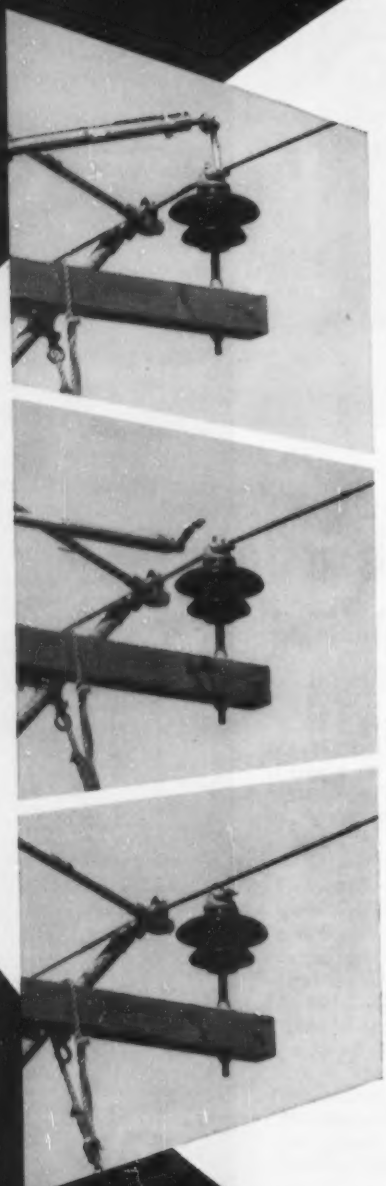
## *electrically and mechanically*
## *O-B Clamptops are "tops"*



While operating men are more concerned with insulators' electrical characteristics, it's not at all a bad idea to consider mechanical properties, too. Construction and maintenance men are apt to give first consideration to units that are easy to work. Both groups are more than satisfied with the O-B Clamptop. Electrically, it's tops; on par with all O-B products. And with men who've "used them all", the O-B clamping method is preferred. Here are three practical reasons why this is so:

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# THE ELECTRICAL WEEK

**The Issue's News Highlights . . .** Both houses of Congress approve new atomic energy bill. It now goes to House-Senate conference to iron out differences.

Priest Rapids Dam controversy may flare up as Grant County PUD and Washington State Power Commission seek FPC permits to build $364-million project.

House approves bill adding nine hydro projects to Army Corps of Engineers civil works list.

**World Power Conference,** meeting in Rio De Janeiro, Brazil, found itself in a situation too absurd for words. Because of the shortage, the hotel where delegates from 25 nations convened to discuss power was without power. The delegates met by candles and lanternlight.

**Moving to offset Pacific Northwest campaign charges** that his Administration was against public power projects, President Eisenhower announced he personally would dedicate McNary Dam on the Columbia River near Walla Walla, Wash., on Sept. 23.

**In Anchorage, Alaska, Interior Secretary Douglas McKay** told the Chamber of Commerce that "only as a last resort" should Alaskans ask the federal government to survey potential hydro sites. Power shortages would continue, he said, until the citizens interested local private firms in tackling the problem.

**Across the border in British Columbia,** Frobisher, Ltd, applied to the provincial government for a water rights license to the B. C. section of the Yukon River watershed. Its subsidiary, Northwest Power Industries, Ltd, intends to develop 4.3 million hp there to supply metallurgical operations of parent company.

**Bonneville Power Administration** has begun stringing the first 345-kv conductor in the United States along 90 miles of the Columbia River from McNary Dam to Wishram, Wash., just east of The Dalles, Ore.

**Government of Columbia approved** a plan worked out by David E. Lilienthal, former head of Tennessee Valley Authority, for development of the Cauca Valley along TVA lines. The project, according to Colombia's ambassador to the U. S., would be a pilot operation for others in his country and Latin America.

**The Dalles and Chief Joseph Dams** on the Columbia River will cost $63 million less than estimated because of more favorable construction costs and economies in design, the Corps of Engineers reported.

**Canadians may be using 750,000 kw** generated from atomic energy "in about a decade," A. E. Grauer, president of British Columbia Electric, predicted. He is a member of a committee guiding Canada's peacetime atomic development.

**Off the Washington Wire . . .** Alabama Power Co has recived a preliminary permit for the Coosa River project recently approved by Congress. Federal Power Commission granted the power permit, to be effective from July until June 27, 1956.

A break is in the offing on the long-stalled negotiations between Interior, Georgia rural electric co-ops and Georgia Power Co for disposal of power from the federal Clark Hill Dam. The White House has taken a hand in the matter and a decision could come within a few weeks.

A group of labor, farm and public power leaders issued a statement praising efforts of public power Senators in the 13-day talkathon on the atomic energy bill.

**Governor Dewey gave Chairman Robert Moses** a working majority on the New York State Power Authority when he appointed William Wilson, architectural engineer and friend of Moses, to replace Hickman Powell. Powell resigned in protest against methods of the outspoken Mr. M.

**Britain's Atomic Energy Authority,** which came into being yesterday, hopes soon to produce power from the atom at 1.2¢ a kwhr. Plans call for 5,000 Mw by 1965 or 1970.

**All-time record sales in the first half of 1954** increased Westinghouse net income by 27% over the first half of '53, Pres Gwilym A. Price reported to stockholders. Net sales billed of $812 million were the highest in any six months of the company's history. Net income of $45 million also set a record for any previous first half year, Price asserted.

**A nationwide campaign** to find the oldest General Electric medium-size transformer still in service was launched yesterday by the company's Power Transformer Dept., Pittsfield, Mass. The company will replace the unit free, set it up as a "monument" outside its new Medium Transformer Plant at Rome, Ga.

**Future Financing . . .** Wisconsin P&L plans to sell $18 million first mortgage bonds due 1984 in October . . . Jacksonville Beach, Fla., is planning to sell $920,000 in utility revenue certificates.

## Regular News Service


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# Atomic Energy Bill Clears House, Senate

The modernized atomic energy bill, which was the backdrop for one of the bitterest and longest public versus private power fights in the history of the Senate, cleared both houses last week.

It was immediately sent to a House-Senate conference to iron out a series of sharply contrasting amendments on power issues (see table on page 8). Unless the Senate views prevailed on the key issues, the embattled band of public power backers promised to renew their talkathon when the amended conference report comes back for adoption.

Passage of the long, complicated atomic energy bill came in the Senate on a 57 to 28 vote and in the House on a 230 to 154 vote. Purpose of the bill, a complete overhaul of the 1946 McMahon Act, is to chart the federal role in all atomic energy activities, foster industrial development of useful atomic power, provide for freer exchange of information, nuclear materials with friendly foreign nations.

Break in the 13-day Senate talkathon on the measure came after public power advocates had succeeded in writing their views into several major sections of the bill.

While the Senate filibuster drew national attention to power issues involved, the House drove through the whole bill after little more than one day's debate. With machine-like precision the House beat down a series of pro-public power amendments (page 8) accepting only one in exchange for tighter patent provisions favored by industry.

Key amendments approved by the House were:

- One providing that electric power generated incident to AEC's research and production activities will be marketed on a preference basis with public bodies and cooperatives designated as priority purchasers. In the committee bill there was no preference clause for marketing of this byproduct electric power.
- Another providing that normal patenting procedure be applied to patents in the peacetime atomic power field except for those conceived while the inventor was employed by the federal government. The committee bill would have subjected atomic power patents to compulsory licensing for the next five years.

Since the Senate had earlier accepted a preference clause relating to disposal of AEC byproduct power, it appeared that this amendment would prevail in the final bill.

It was on the Senate side that the bleary-eyed public power backers made their gains. In between the eight and 13-hour speeches delivered by Sen Wayne Morse (Ind-Ore.) they took an occasional vote on various power issues.

Key power amendments adopted by the Senate included:

- One by Democrat Edwin Johnson of Colorado empowering AEC to enter the power business as a producer of electric energy either alone or in cooperation with other federal agencies. Power marketed would be subject to preference clause.
- Another by Democrat Guy Gillette requiring AEC to extend preference to public bodies and cooperatives in disposing of byproduct power.
- Another by Democrat Albert Gore, leader of the public power forces in the Senate, prohibiting AEC from reimbursing private firms for income taxes on profit contracts.

It was this latter amendment, adopted by voice vote, that put the first small crimp in the proposed power supply contract between AEC and a private utility combine headed by Edgar H. Dixon, president of Middle South Utilities, Inc, and E. A. Yates, chairman of the board of the Southern Co.

It was this proposed contract that has been at the center of the Senate debate since it began July 13. Under terms of the contract proposal, as outlined by AEC, the Dixon-Yates group would build a 600,000 kw plant at West Memphis, Ark., to feed power into the Tennessee Valley Authority system at Memphis, Tenn. This would replace TVA power to be delivered to AEC at Paducah, Ky.

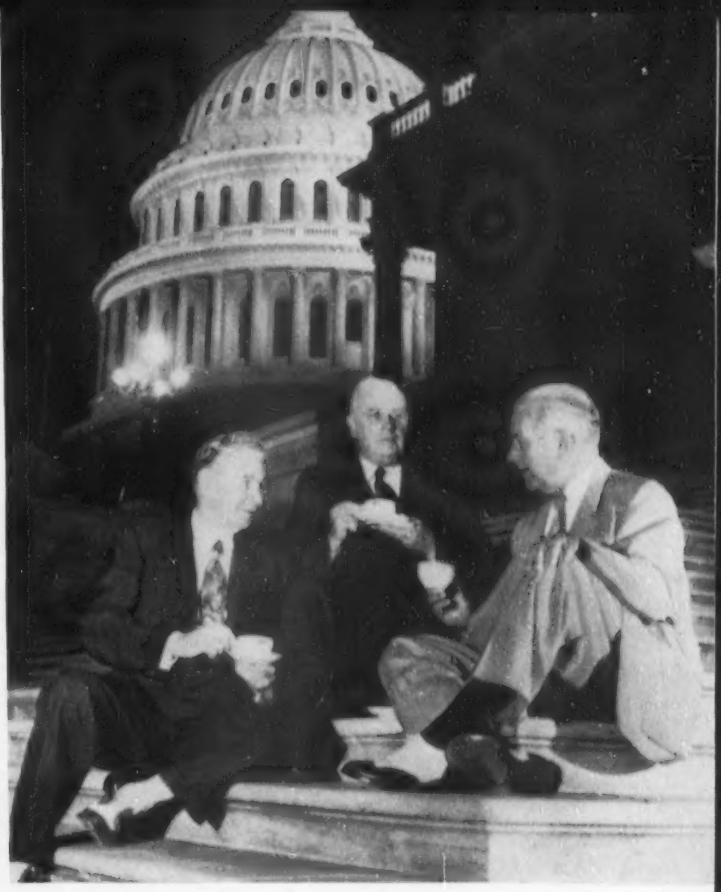
TVA area Senators lead by Gore with an assist from Republican Senator Cooper of Kentucky (EW, July 26, p 74) have interpreted the contract as a means of stifling TVA growth. President Eisenhower, who directed that AEC negotiate the contract, has given credence to this belief by saying the contract is a stopgap move to give him time to study the future course of TVA activities. In public appearances before the Joint Congressional Committee, the four present AEC commissioners have dis-

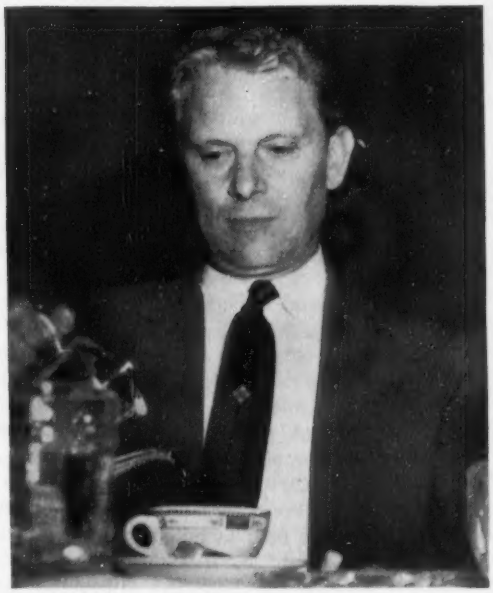
# PICTURES: Senators Take Breather During Record-Breaking Debate

Senate Majority Leader William F. Knowland (top left) ordered round-the-clock sessions to assure action on atomic bill and had cots set up for Senators.

At top right, three Senators—James Murray, Alexander Wiley, and J. Glenn Beal—took a coffee break on the steps of the Senate Office Building during one of the night sessions.

Three long talkers fighting against the Administration bill were Albert Gore (center left) drinking coffee after a seven-hour talk, William Langer (center right) washing up before taking the floor, and Wayne Morse, trying to catch a few moments of rest in between his frequent and lengthy orations against the atomic bill.





# Votes on Key Amendments to Atomic Bill

## Senate

## House

### AEC in Power Business

**Adopted 45-41**
Amendment empowering AEC to generate and sell power from nuclear plants giving public bodies and cooperatives preference in purchase the power. Offered by Edwin Johnson (D—Colo.).

**Adopted 161-118**
Amendment prohibiting AEC from selling or disposing of electric power except as incident to its activities in conducting research or producing fissionable material. By Sterling Cole (R—N. Y.).

**Rejected by voice vote**
Amendment urging federal government to undertake a comprehensive program for production and distribution of power from nuclear fuel. By Chet Holifield (D—Calif.).

### Preference

**Adopted by voice vote**
Amendment providing preference to public bodies and cooperatives in applying for licenses to build, operate atmoci power plants. By Hubert Humphrey (D—Minn.).

**Adopted by voice vote**
Amendment providing that electric power generated incident to AEC research and production activities be marketed under preference clause. By Guy Gillete (D—Iowa).

**Rejected by voice vote**
Amendment requiring that public bodies and cooperatives be given preference in applying for atomic power plant licenses. By Gracie Pfost (D—Idaho).

**Adopted by voice vote**
Incidental power generated by AEC shall be marketed giving preference to cooperatives and public bodies—under the preference clause. By Robert E. Jones, Jr (D—Ala.).

### Dixon-Yates Power Contract

**Rejected 55-36**
Amendment which would prohibit AEC from entering power supply contracts where AEC is not directly served—in effect, prohibiting the Dixon-Yates contract. By Clinton Anderson (D—N. M.).

**Adopted 56-35**
Amendment specifically authorizing AEC to enter contract of Dixon-Yates type. By Homer Ferguson (R—Mich.).

**Rejected 172-115**
Amendment which would prohibit Dixon-Yates contract. By Jere Cooper (D—Tenn.).

### Patents

**Adopted by voice vote**
Amendment extending from five to ten years period in which basic patents in atomic power field are subject to compulsory licensing. By Robert Kerr (D—Okla.).

**Adopted 203-159**
Amendment providing normal patent procedures for all patents in the peacetime atomic power field except those conceived while the inventor is employed by the federal government. By Sterling Cole.

### Miscellaneous

(Not Comparative)

**Adopted by voice vote**
Amendment prohibiting AEC from reimbursing a corporation for income tax on profit contracts—in effect killing one provision of Dixon-Yates proposal. By Albert Gore (D—Tenn.).

**Adopted by voice vote**
Amendment providing that atomic plant licensees be subject to Federal Power Commission regulation. By Humphrey.

**Rejected by voice vote**
Amendment requiring that AEC license fees be based on a percentage of profits derived from operation of privately owned plants. By Sidney Yates (D—Ill.).

played a 2-2 split over negotiating the contract. Commission opponents argued that the contract forces AEC into the role of power broker for TVA.

It was the accounting setup of the proposal that suffered Senate disapproval by way of the Gore amendment. The accounting would work something like this: in compensating Dixon-Yates for power deliveries at Memphis, AEC would pick up the entire tax bill relating to this block of power. This would include Arkansas state and local taxes and federal corporation income taxes. For the remainder of the power bill, AEC would credit TVA for power deliveries to the AEC Paducah plant and charge TVA for Dixon-Yates power deliveries to TVA at Memphis. If TVA ran a deficit in the transaction, AEC might assume either part or all of it.

By keeping the tax payments separate, AEC would thus spare TVA from putting this operating expense into its rate structure.

The Gore tax amendment was accepted by the Senate Republican leadership after some 25 minutes of explanation by the Junior Tennessee Senator. At first it looked like a major break in the dawn-to-dawn sessions. With approval of the Gore amendment, it was conceded debate could be brought to a quick conclusion. But the public power fighters didn't want to be cramped by debate limitation.

Sen Wayne Morse, Oregon Independent, offered an amendment requiring private industry to pay the full cost for any atomic fuel furnished by the government. Republican Floor Leader William Knowland moved to table the Morse amendment and won. The plan for a shortened debate temporarily collapsed.

Fresh, argumentative Morse took the floor at midnight and set a new record by speaking until 12:22 pm Tuesday (July 27) without the interruption of a quorum call. This was considerably short of his previous 22-hour speaking record on the Tidelands bill last year, but that one was interrupted by a quorum call. He had previously talked for an eight-hour stretch on the atomic energy bill.

The Senate spectacle blasted the last hopes of the Republican leadership to meet its July 31 adjournment target. It now appeared that even Aug. 14 was an optimistic date for Congressional leave-taking.

## Priest Rapids Dam...

### . . . may stir controversy in Northwest as both PUD and commission seek FPC permits

A full-fledged battle may flare up in the Northwest over development of the Priest Rapids site of the Columbia River. Federal Power Commission soon must consider two applications for permits to build the $364-million, 1,219,000-kw project near Ephrata, Wash., as a result of action by the Washington State Power Commission.

Grant County PUD of Ephrata has had an application pending for some time and has been hoping for early approval. It asked that the commission take no action filing an application until an open hearing had been held. However, the commission ignored the request by authorizing application for a permit (EW, July 26, p 73).

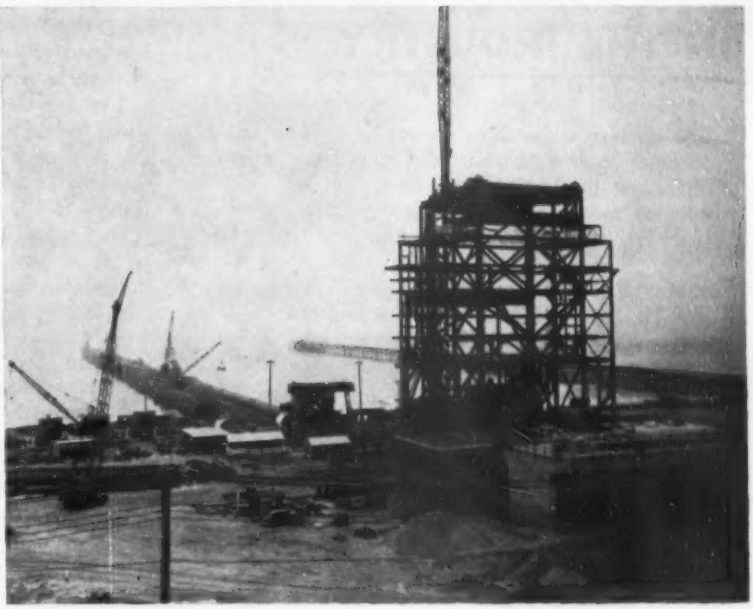
**Commission's View . . .** Walter S. Gordon, commission chairman, has emphasized the state agency is not "moving in" on the PUD's interests. The state would file an application simply to forestall any possibility that the state might eventually lose any chance to build the dam, should the PUD's plans fail to develop, he said.

Representatives of the seven PUD's agreed at a meeting in Seattle that Grant County PUD should proceed with plans to build the dam despite "competition" from the commission. PUD's represented were Cowlitz, Grant, Grays Harbor, Douglas, Lewis, Mason, and Pend Oreille.

**PUD Meeting Called . . .** Grant County PUD has called a meeting for Aug. 20 at Ephrata to determine who can build the dam "best and cheapest." It is reported the PUD favors two dams rather than one at the site.

State Power Commission has authorized negotiations with various consultants for preliminary work on financing the project. Commission's cost estimate of $364 million for one dam is based on Army Corps of Engineers figures using 1953 construction costs.

Harza Engineering Co made cost studies on a single dam and two-dam project for Grant County PUD in 1952. Estimates were $358 million for two dams, $412 million for one.



## Control Wiring Begins at El Segundo

Construction of Southern California Edison Co's $25.6 million El Segundo steam station is progressing with the installation of electrical control wiring. The first 156,000-kw generating unit is scheduled for operation in July, 1955.

Off-shore underwater conduits consisting of two 10-ft diameter concrete pipes are about 35% complete. The temporary trestle, serving as a platform for laying the conduits, now extends 2,000 ft into the ocean with 600 ft yet to be completed.

## Middle South, Southern Set Up Generating Firm

A $5.5-million company has been incorporated in Little Rock, Ark., to build a 600,000-kw power plant at West Memphis when and if a contract is worked out with Atomic Energy Commission. Power from the plant would be sold to Tennessee Valley Authority to replace power TVA now is feeding into AEC's Paducah, Ky., installation.

Capitalization for the new company was divided into 55,000 common shares at $100 each. Estimated cost of the proposed plant would be $107,250,000. Plant would be financed by borrowed money in addition to the $5.5 million equity capital. The common stock will be owned by Middle South Utilities, Inc, and the Southern Co.

Arkansas Power & Light Co Pres R. E. Ritchie described formation of the company as preliminary. He explained: "There has to be a company when, and if, negotiations are complete. There has to be somebody to sign a contract so the building of the plant can proceed." Arkansas P&L is a subsidiary of Middle South.

The plant would be constructed by Ebasco Services, Inc.

## Senate Committee Ok's Upper Colorado Bill

The Senate will get the bill authorizing the $1.5-billion upper Colorado water storage project for debate if there is time enough before adjournment to take it up. Proponents are getting pessimistic that Congressional action—the House must still consider the legislation, too—can be completed before the curtain is rung down on the current session.

The Senate Interior Committee has approved the program, including the controversial Echo Park Dam, as has its House counterpart. Project's initial power capacity would be 1 million kw. Later phases would add another 622,000 kw.

# IN THE INDUSTRY

The summer offers those in the industry an excellent opportunity to do a little checking on the various changes taking place in the industry. There are no important association meetings. Few big projects are started. So summer is the best time of the year for utility men to do a little thinking and reflecting. Otherwise they might find little to do other than keeping the customers supplied with electricity. And these days customers really want a lot of kilowatthours—a record nine billion last week.

**Summer Offers Time To Do a Little Checking**

Look at the output chart on page 3. With the year seven twelfths gone, it is obvious that productionwise this will be another record year. There is considerable disagreement as to the exact percentage output this year will increase over 1953. But actually it doesn't make too much difference. The increase is certain to be substantial.

**Not Like in the Good Old Days . . .** The mountainlike peak on the chart showing the output in recent weeks brings back memories of years not long gone when the summer always brought a slump. The coming of air conditioning changed that. It has put July and August on a par with December and January as peak usage months. It has shifted the peak load of some companies from winter to summer. It has given some others summer and winter peaks that are about equal.

These summer peaks are bringing to an end one of the industry's oldest traditions. For years summer time has been synonomous with maintenance time. In summer units were shut down and overhauled. Lines were rebuilt. Other equipment was repaired or replaced. But units can't be shut down when power demand is sky high. Spring and fall may soon become the traditional maintenance periods.

For companies whose winter peak has been replaced by a summer one, a quick change in sales strategy is called for. After gearing their sales staffs to pushing summer load, they must now get them behind promotion of winter load. More and more of these companies see electric house heating as the answer. And this adds a bit of load in spring and fall.

**Cool Water not Air Is Utilities' Need . . .** Cooling is not only important to the residential customers. It's important to the power companies themselves. But they want cool water and not cool air, and they want it winter **and** summer. With power plants getting bigger and water getting no more plentiful, utilities are having a hard time finding any water, much less cool water, for condensing purposes. But the engineers as usual have been on the job. Their solution is the cooling tower (Watch for the Sept. 6 issue). About ten years ago these towers were a rarity in this country although there were many installations abroad. Last year 38 installations were sold. Most of them are in the Far West and the Southwest. But there is one as far east as Scranton, Pa.

Before World War II most American utility men were rather scornful of the cooling tower. What made them change their minds? The answer is the unforeseen expansion program which increased capacity from 42 million kw in 1941 to 94 million kw today. First, many companies found there just wasn't enough water available for these new units. Second, other companies found enough water available in their areas but couldn't buy sites along it.

That practically the first natural resource to become scarce should be water is a bit ironic. For years politicians and economists have been alarming the people about shortages of oil, coal, timber, iron, and a dozen other resources. Today one they didn't mention, water, is the scarcest of all.

As for coal the utilities can get all they want simply because no one else wants it. Electric companies form the largest coal-consuming industry in the country taking at least a third of this year's production of bituminous coal. What is more the utilities are adding so much coal-burning equipment that by the end of 1958 they will be burning some 176 million tons a year as compared with 132 million tons this year. In these yearly totals are included some anthracite. Yet here too the utility industry is important. One company, Pennsylvania Power & Light, is the largest user of anthracite in the world.

Practically every power supplier in this country is affected, or soon will be, by these industry conditions. A little thinking and reflecting this summer by company executives might save time, money, and trouble in the not too distant future.

# TECHNICAL NOTES

ARCHER E. KNOWLTON

**Quick starting** of a turbine-generator is facilitated by a bypass around the main and reheat cylinder to the condenser to establish mass steam flow through the superheater and reheater for temperature build-up.

**Electric locomotives** have been constructed to produce 4,000 rail hp per 100 tons on drivers while (1951) no American diesel has exceeded 1650 rail hp per 100 tons on drivers.

**Sulfur hexafluoride gas** can have dielectric strength superior to many liquid or solid insulating materials and even at low pressure could be considered for high voltage apparatus.

**Inductive and capacitive unbalances** present in untransposed transmission lines in a solidly grounded system result in a fundamental, zero-sequence current in the lead between the neutral and ground of the power transformer used for grounding the system.

**Trouble with ice** in switch operation occurs generally with light coatings of clear ice formed at above 15 F after rain has fallen above freezing with time elapsed to penetrate the inner bearings.

**Interlocks can raise hob** with getting a unit going if designed, ordered, fabricated, assembled, and/or installed improperly.

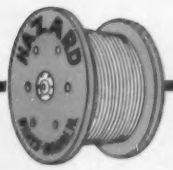
**Instruments installed** in the electrical galleries and control rooms are much less subject to deterioration than those exposed to the oil and heat of the boiler and turbine areas.

# USE THE CABLE THAT FITS THE JOB!

Flexibility and toughness are musts for a good cable for portable tools . . . flexibility for easy handling, and toughness to resist constant twisting and abrasion. Hazacord Types SO and SJO meet these demands; they are the outstanding choice wherever long service life is an important factor.

Hazacord Flexible Cords and Portable Cables are built to withstand the abuse that they will get on the job. Tire-tread toughness is built into Hazard cables by vulcanization in a continuous metal mold. The metal mold curing of the tough Hazaprene ZBF sheath combined with flexible conductors, strong laterals and a dependable insulation mean long service life and less frequent replacement in every portable cord or cable application.

Write for illustrated Bulletin H-451 for more detailed information on Hazacord Portable Cables to Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

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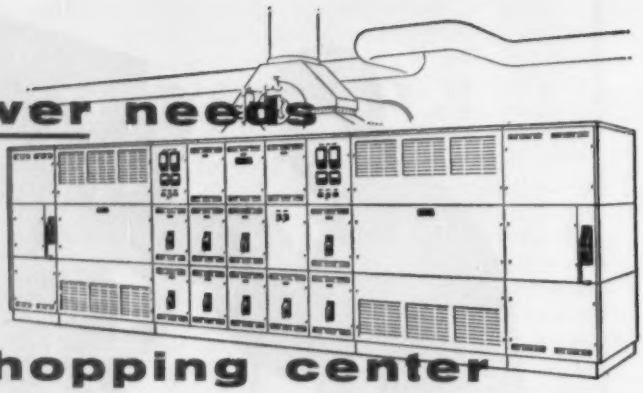
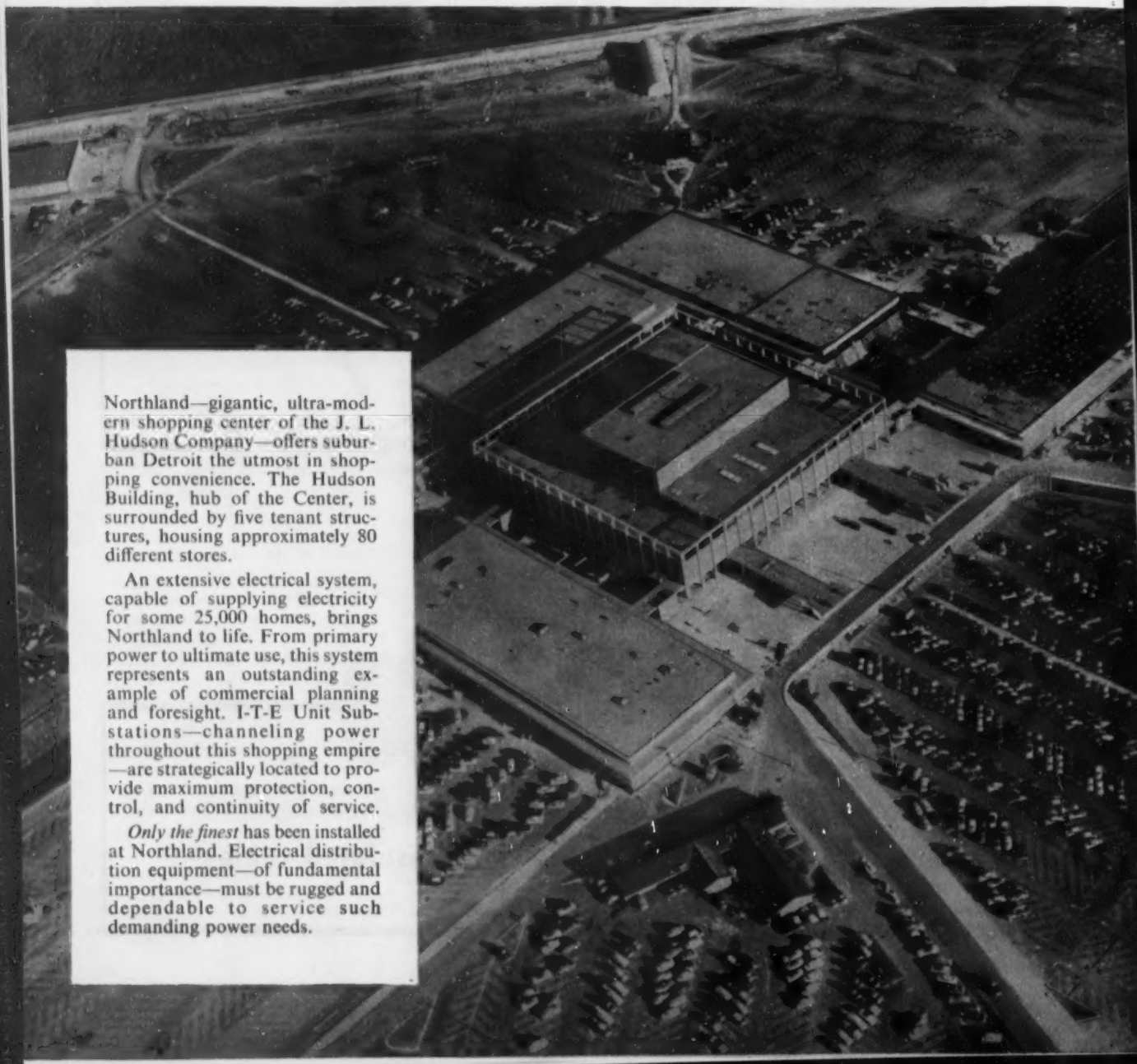
**HAZARD**
**insulated cables**

# Servicing the Power needs of the world's largest shopping center





Northland—gigantic, ultra-modern shopping center of the J. L. Hudson Company—offers suburban Detroit the utmost in shopping convenience. The Hudson Building, hub of the Center, is surrounded by five tenant structures, housing approximately 80 different stores.

An extensive electrical system, capable of supplying electricity for some 25,000 homes, brings Northland to life. From primary power to ultimate use, this system represents an outstanding example of commercial planning and foresight. I-T-E Unit Substations—channeling power throughout this shopping empire—are strategically located to provide maximum protection, control, and continuity of service.

*Only the finest* has been installed at Northland. Electrical distribution equipment—of fundamental importance—must be rugged and dependable to service such demanding power needs.

## at Detroit's

# NORTHLAND PROJECT

**vital energy for a shopping wonderland**
**supplied by I-T-E dry-type, double-ended Unit Substations**

Eleven I-T-E metal-enclosed Unit Substations, rated 1500 and 2000 kva, service the Center's immense lighting and power requirements. And to assure service continuity, Northland's electrical system features I-T-E Selective Tripping devices on the circuit breakers, which *isolate* system faults by interrupting only the circuit nearest the fault.

From the start, important engineering aid was given Northland by I-T-E application engineers. Thanks to this close cooperation, power distribution equipment was on hand *when needed* to fit right in with tight construction schedules.

I-T-E is proud of its place as a *major* contributor of quality power distribution equipment for the "world's largest shopping center."

**AT NORTHLAND—**

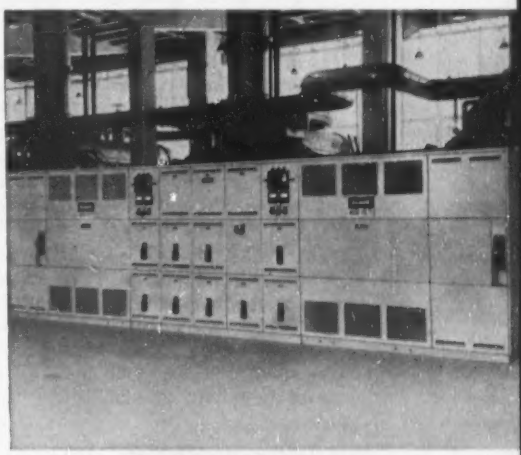
***I-T-E Substations service:***

| | |
|---|---|
| **interior lighting** | **escalators** |
| **exterior lighting** | **pumps & blowers** |
| **display lighting** | **air conditioning** |
| **elevators** | **compressors** |
| **conveyors** | **refrigeration** |

*For details contact the I-T-E field office nearest you. Look in your classified directory under "Electric Equipment."*

**I-T-E UNIT SUBSTATIONS**
service all interior lighting needs of the Center.

**I-T-E UNIT SUBSTATIONS**
installed in basement of Hudson Building for 4800—120/208 volt lighting distribution.



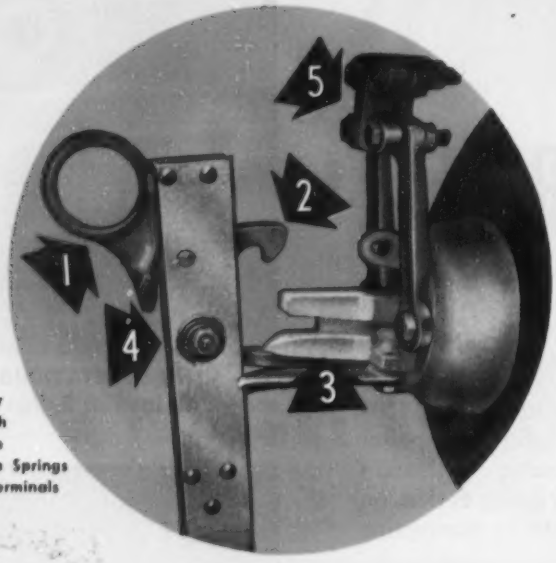
**I-T-E UNIT SUBSTATION**
installed in Utility House for 4800—480 volt power distribution.

THE SYMBOL OF QUALITY SWITCHGEAR

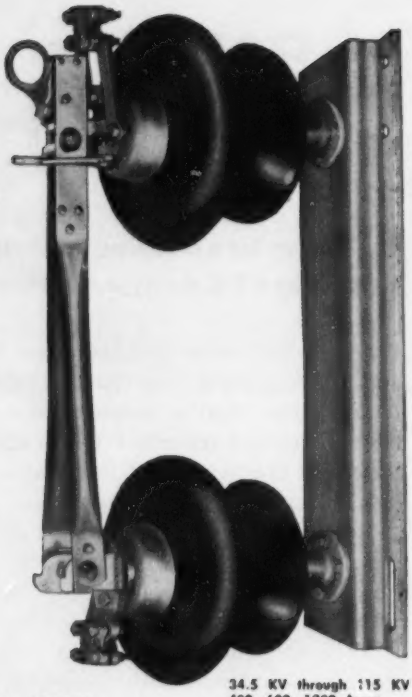
**I-T-E CIRCUIT BREAKER COMPANY**

19TH AND HAMILTON STREETS, PHILADELPHIA 30, PA.

**UNIT SUBSTATIONS**




1. Pryout Lever
2. Double Latch
3. Split Tongue
4. Compression Springs
5. Universal Terminals



34.5 KV through 115 KV
400, 600, 1200 Amps.

# For extra ruggedness in Hook Stick Disconnect Switches

## specify CHANCE BT

Hook Stick Disconnect Switches *have* to be rugged. Heavy side thrusts—when the closing force must be applied from an angle — cause some switch blades to flex and make quick, sure contacts impossible.

That's why CHANCE Hook Stick Switches are designed with emphasis on *really rigid* contact blades—like the double-trussed tubular blade that gives unequalled strength to Chance Switches from 34.5 through 115 KV . . . the heavy flat parallel bus bars that serve as blades in the 23 KV and smaller 1200 amp. switches . . . or the flange-reinforced bus bar blades on the 400 and 600 amp. switches rated 23 KV and below.

In addition to rigid blades, Chance Disconnect Switches have many other features that add up to smooth operation through many years of service. Five of these are shown in the inset above.

**1.** A downward pull on the extra large ring actuates a powerful pryout lever that works like a claw hammer to break ice accumulations with ease.

**2.** Double latch hooks lock the blade in position so firmly that even tremendous magnetic forces caused by heavy faults can't make the switch open. The latch is held securely by a non-ferrous, sleet-protected spring inside the blade end.

**3.** A split tongue contact always centers clip pressure directly over the contact area.

**4.** High contact pressure is kept constant by bronze compression springs and spherical washers.

**5.** Chance Disconnect Switches are equipped with time saving universal terminals that fit any conductor size you use.

All Chance switches have flanged bases that will not cut into wood structures and cause constant maintenance problems after installation. All meet NEMA and AIEE requirements and they all have passed Chance engineers' severe tests for high currents, icing, insulation characteristics and long life. Why not get full details today?

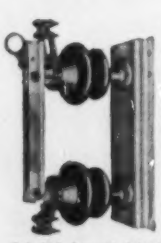
*You know it's RIGHT when you specify CHANCE*

ABC INDUSTRIES

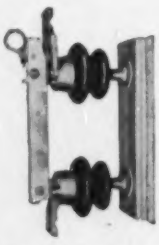
A·B·CHANCE CO·

CENTRALIA, MISSOURI
SAN FRANCISCO, CALIFORNIA

C52-6A



7.5 KV through 23 KV
400, 600 Amps.



7.5 KV through 23 KV
1200 Amps.

# 9 Hydro Projects . . .

## . . . added to Army Corps of Engineers' civil works list in bill approved by the House

Congress last week was preparing to add nine proposed new hydroelectric installations to the Army Corps of Engineers' backlog of civil works projects.

The nine (see table below) were included in the omnibus river, harbor, flood control, and beach erosion project bill which the House passed early last week. These civil works projects would be built by the Corps of Engineers provided funds are voted at some later date in separate legislation.

The Senate was expected to give quick approval to this bill which amounts to little more than initial Congressional authorization for some $890 million worth of waterway development and protection projects. Those having power features would account for roughly $414 million of the total amount authorized.

**Partnership Projects . . .** One new feature of the bill is that power projects are authorized on a partnership basis with local interests offering to foot costs for the actual power installations. The City of Eugene, Ore., for instance will contribute some $10 million toward construction of the $37.4-million Cougar project on the McKenzie River. In return, the municipality is to secure and market the power output of the project.

Private utilities have indicated interest in a similar deal in connection with the Green Peter and White Bridge projects on the Santiam River in Oregon.

Biggest single project in the new authorizations would be the $161.3-million Lower Cumberland project in Kentucky and Tennessee. This would be downstream from the Cheatham project already near completion by the Army Corps of Engineers. The Cheatham power output has been fed into the Tennessee Valley Authority system, and it appears likely that TVA will also try to get the Lower Cumberland output when that project is built.

More popularly known as a "pork barrell" bill, the omnibus waterway development measure has been a regular feature of every Congress since 1944 with the exception of the Democratic 82nd Congress (1951-2). Total amount of the authorization this year, $890 million, was the lowest since the Republicans had control of Congress in 1947-8. The Republican 80th voted to authorize only $160 million, but that small bill has since been described as covering relatively few projects which were "of an emergency nature."

### Civil Works Omnibus Bill Power Projects

| Basin | Project | Installed Capacity (kw) | Cost (millions) |
|---|---|---|---|
| Cumberland (Tenn. & Ky.) | Lower Cumberland | 130,000 | $161.3 |
| Brazos River (Tex.) | Belton | 18,900 | 21.5 |
| White River (Ark.) | Greers Ferry | 64,000 | 27.0 |
| | Beaver | 64,000 | 45.0 |
| Columbia River (Ore. & Wash.) | Cougar | 25,000 | 37.4 |
| | Green Peter | 81,000 | 49.7 |
| | White Bridge | 15,000 | 8.5 |
| Osage (Mo. & Kan.) | Stockton | 7,000 | 37.7 |
| | Pomme de Terre | 7,000 | 25.8 |

## Steel Light Pole Is Put to the Test

Steel light pole tube undergoes tests at Pacific Car & Foundry Co's Renton, Wash., plant to find out how much load and stress it can take in way of brackets, fixtures, wire loads, signs, and emergency stresses of wind, ice, or impact. Two Pacific Car engineers measure effects of the stress placed on the Carco pole tube by the chain hoist. Instruments used to measure the results of the test are a dynometer on the chain hoist and an electrical strain gauge being examined by the two engineers in the background. Looking on are officials from Seattle's Engineering Department.

## Study on Forecasting Stream Rise Planned

Short range forecasting of stream rises will be studied by Washington State College, Pullman, in a special project for the Bonneville Power Administration.

Paul F. Ruff, hydraulic engineer heading the project, said that efficient utilization of water as a power source depends largely on the ability to use flood-flow water as it reaches dams. Advance notice of the amount of increased stream flow will avoid spilling at dams.

He said that college hydrologists will study the Walla Walla, Palouse, Clearwater, Snake, Yakima and Columbia Rivers, attempting to set up a system for predicting the amount of stream rise that may be anticipated after a storm, and for five to ten days before the volume of water reaches a dam.

The stream flow study will be undertaken by the hydraulics section of the college's division of industrial research.

Metropolitan Edison's idea for integrating its operating departments:

# Bring 'Em All Together,

You could almost say the huge heat pump Metropolitan Edison Co installed at its new operating headquarters just north of Reading, Pa., was a symbol of the company's newfound unity of operations.

The pump heats and cools the whole works: corporate and divisional office facilities; engineering, operating and garage departments; and service and display departments, brought together under one roof from three separate locations in the city.

Met Ed made transfer of operations to the new headquarters official last month with an open house that brought families and friends of employees streaming through the modernistic doors. Company officials showed off the heat pump proudly; it is among the few large commercial installations in the country.

Faced with burgeoning engineering and operating departments, and unnecessary costs brought on by duplicated facilities, the company decided to consolidate its operations. Months of study led to selection of a headquarters site at 2800 Pottsville Pike, six-tenths of a mile north of the city.

**Into the Suburbs . . .** Because its widespread operations require frequent contact between field and staff forces, location in a suburban area was advantageous. This also provided freedom of movement for service trucks and other mobile equipment, eliminating traffic congestion and parking problems.

Met Ed broke ground for the project late in 1952. Tract on which the buildings stand sprawls over 57 acres with a frontage of 1,850 ft along the highway.

Many new techniques in building were combined in the headquarters to give the 570 Reading employees best possible working comfort and convenience, and in turn provide more efficient service for customers.

The center has two sections: office building and service building. Both are fireproof structures of steel, concrete, aluminum and brick. They are joined by a glass-enclosed passage.

The office building is 308 ft long and 48 ft wide with a wing 52 ft by 80 ft. It has three levels, and floor space totalling 70,000 sq ft. Front and back of the building are covered with insulated aluminum siding anchored to a steel framework. Entrance and end halls are of brick. Rows of sealed aluminum frame windows run the length of the building. The heat pump's summer cooling action makes it unnecessary to open the windows except for cleaning.

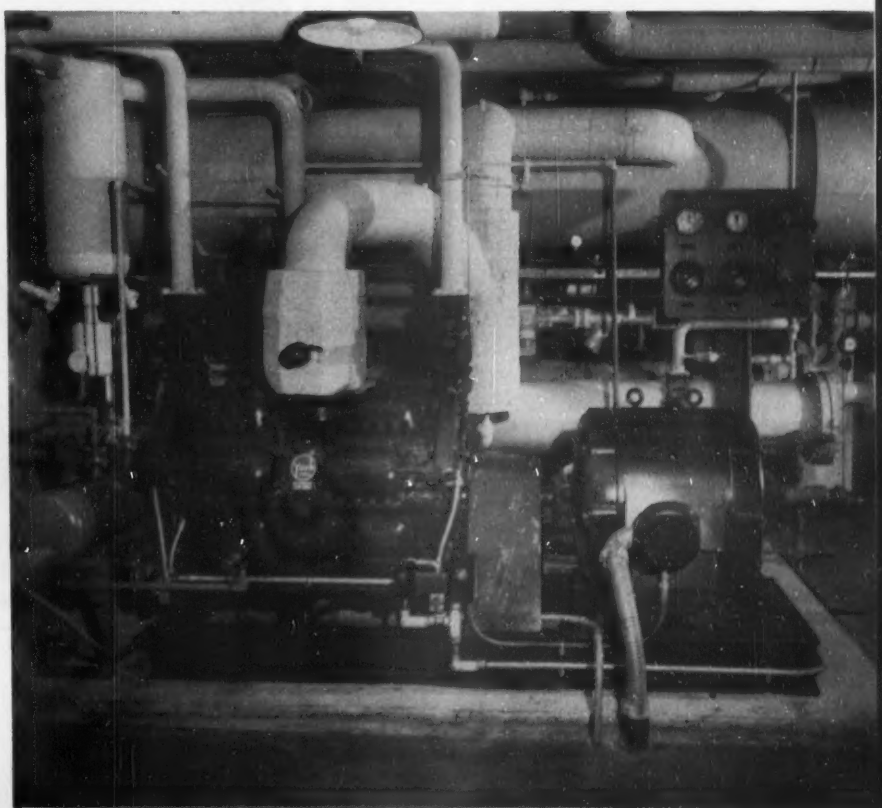
North of the office building is the service building. It contains an auditorium and home service facilities, and expands into a two-story garage and storehouse 180 ft by 312 ft. This building has 120,000 sq ft of floor.

Met Ed's bright new operating headquarters in a Reading (Pa.) suburb combines three previously separate offices, many service facilities under one long, low roof

# Spark 'Em With a Heat Pump

**Look to Future . . .** For all the building's modernity, it's that heat pump that marks it as ahead of its time. Company officials believe the "pump" will become the universal heating-cooling system of tomorrow, because it can be installed cheaper than a combined conventional heating and air-conditioning system. This particular model differs from others now in operation in that it draws its "heat" from well water and the refrigerant always flows in the same direction, regardless of whether it is on the heating or cooling cycle. Valves in the water lines are used to shift cycles.

Having a heat pump in Metropolitan Edison's own building is good promotion, officials feel. Just as the modernistic building is good for public and employee relations, the heat pump is good for power sales. It shows, say Met Edison load-conscious officers, just one of the many ways electricity can be used to advantage.



OPEN HOUSE at Met Ed. Pres. O. Titus welcomes A. J. Sordoni, Pennsylvania Secretary of Commerce

## 7,500 People on a Saturday . . .

. . . came to see Metropolitan Edison's new service and operations center north of Reading, Pa. The company held open house, showed the public around the new facility. The building, officials explained to the visitors, would make for more efficient operations, and thus better service.

OFFICE WALLS of steel pane's can be adjusted readily to change size of any area inside the building

GUESTS OF THE COMPANY heard an official explain mechanics of dispatching board as load dispatchers put the system through its paces

EFFICIENT, FRIENDLY ATMOSPHERE is fostered by low counter in building's lobby, where customers may apply for service and pay their bills

STOREHOUSE FOR SUPPLIES was designed for ease of handling. Binless storage area opens on to a truck loading platform near garage

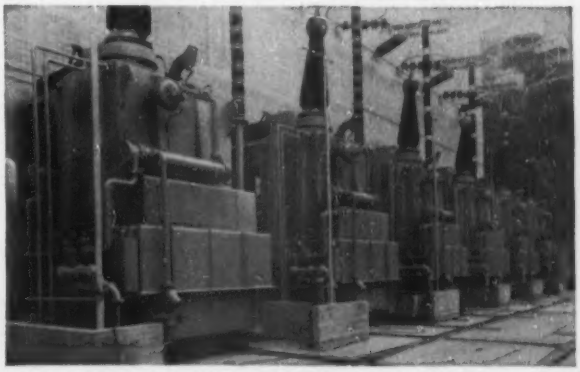
# WHERE is this 230 kv Pennsylvania Transformer going?

The snow and tall fir trees in the background of the top photograph are two substantial clues that this transformer is headed for the Great Northwest. Further study of the picture will reveal that the transformer is *traveling in an upright position* and is *completely assembled* except for bushings and forced-cooling equipment.

When a large power transformer arrives at its installation site in this manner, ordinary rigging methods can be used to move the transformer from the drop center railway car to the foundation pad. Time and money will be saved in this operation — especially in remote places where special or heavy rigging equipment is not readily available.

Furthermore, the problem of putting a transformer into service is greatly simplified when it arrives at its destination completely assembled and in a one-piece tank. That was how the six transformers in these two 87,000 Kva banks reached the Great Northwest.

Prior to shipment, the covers were welded shut and the units gas-filled to keep the interiors of the transformers dry for their trip across the country. When the bushings, heat exchangers, and accessories were assembled, the transformers were ready for operation.



Contour-design, shell-form power transformers, such as these 230 Kv, 29,000 Kva units, can be designed and built by Pennsylvania in sizes up to 300,000 Kva and in voltages up to 330 Kv.

**PENNSYLVANIA TRANSFORMER COMPANY**

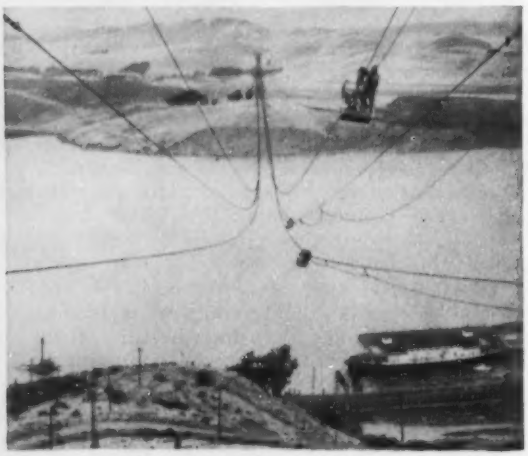
*A McGraw Electric Company Division* • **CANONSBURG, PENNSYLVANIA** • *Greater Pittsburgh District*

# PG&E's Carquinez Crossing Gets New Coat of Paint

Steel conductors on Pacific Gas & Electric Co's 110-kv crossing over Carquinez Strait soon will be sporting a new coat of paint. Including three shorter spans, it will take two to three months to clean, prime-coat, and paint the 7½ miles of conductor.

The 4,427-ft crossing, located about 25 miles from San Francisco, has six conductors. Work will progress from center of each conductor toward towers, with one trip each for cleaning, prime-coating, and painting. Trolley cages carry one painter and his equipment.

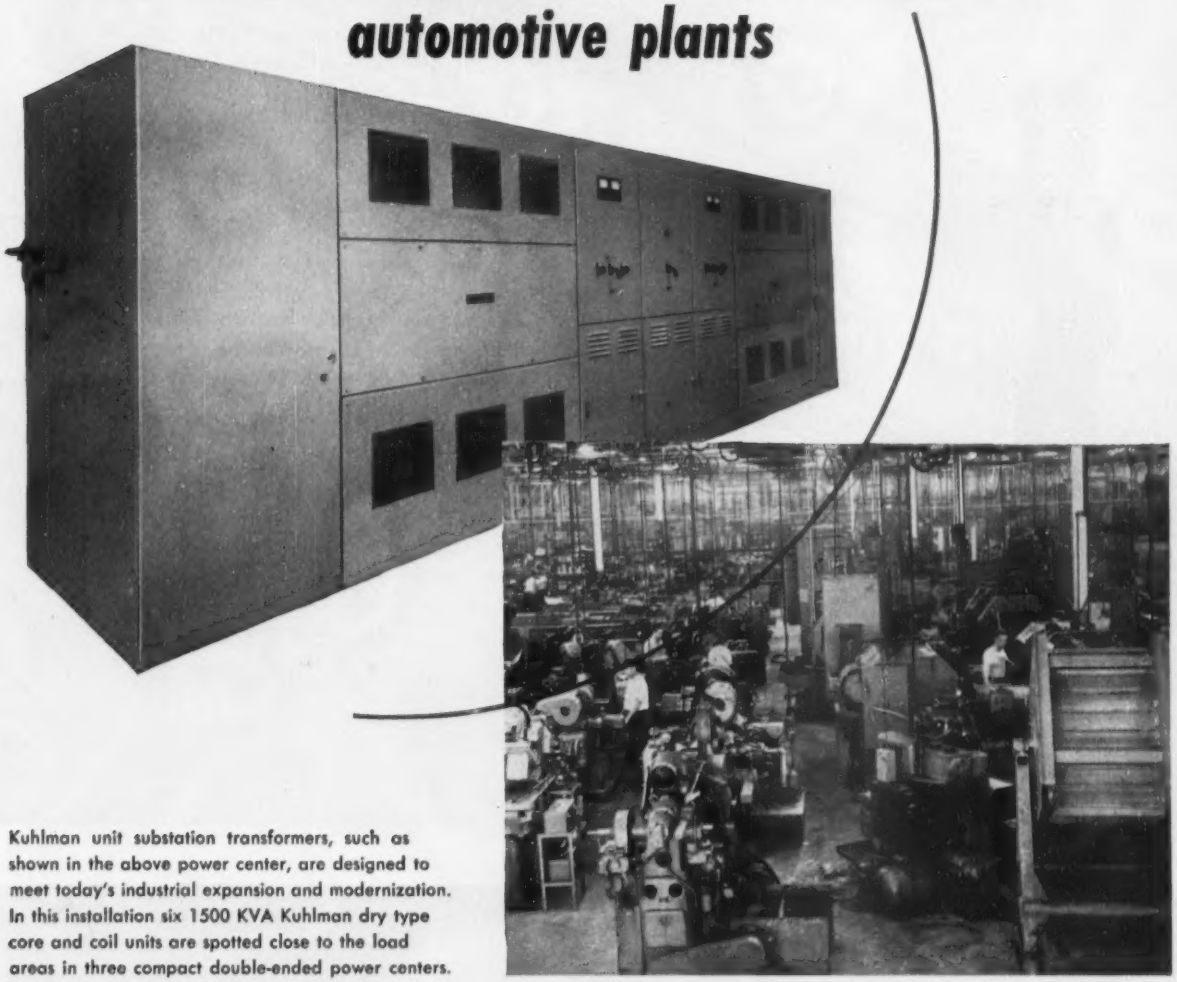
Because only the circuit being painted is de-energized, trolley pay-out line is suspended every 80 ft from conductor to prevent it from hitting energized circuit.



# KUHLMAN

## POWER CENTER TRANSFORMERS

### in one of America's largest ultra-modern automotive plants



Kuhlman unit substation transformers, such as shown in the above power center, are designed to meet today's industrial expansion and modernization. In this installation six 1500 KVA Kuhlman dry type core and coil units are spotted close to the load areas in three compact double-ended power centers. Each power center contains two identical core and coil units, one serving as a right hand unit and the other, turned 180°, serving as a left hand unit.

Kuhlman Electric Company, employing the most advanced engineering and construction methods, can supply power center core and coil units or the complete transformer sections with enclosure. Forced air cooling may be added to increase the KVA capacity for either peak load conditions or plant expansion.

Be sure to specify Kuhlman power centers when planning your plant's expansion or modernization program.

# KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

**NORTH**—Shakopee, Minnesota praised the performance of its Form 206 luminaires. The new lights provide superior illumination even in sub-zero weather.

**EAST**—Central Maine Power Co. accomplished their working objective of providing better street lighting economically by installing Form 206 fluorescent lights at Auburn, Maine.

# NEW G-E FLUORESCENT STREET LIGHTS GAIN NATIONWIDE ACCEPTANCE

*Are fluorescent street lights practical? Utility and municipal officials who have installed G-E Form 206 fluorescent luminaires are best qualified to give the answer. Their actual field experience, in all parts of the country, is summarized in the following questions and answers.*

**WHY USE FLUORESCENT STREET LIGHTING?**

Fluorescent street lighting provides better visibility and a more even light distribution than the best engineered systems of either filament or mercury lamps. The low brightness of the light source reduces the glare and eye strain that accompanies other types of street lighting.

**IS VISIBILITY IMPROVED?**

Yes. Many lighting experts believe that fluorescent street lighting increases actual visibility by about one-third. Thus, a 1.25 footcandle level from a Form 206 fluorescent luminaire seems to provide the same visibility as a 1.7 footcandle level from filament or mercury luminaires.

**IS THE COLOR OF THE LIGHT PLEASANT?**

Yes. The whiter light furnished by the fluorescent lamps does not distort the familiar coloring of objects and people. Businessmen find that shoppers even come from outside usual trading areas to shop under the comfortable light from the fluorescent luminaires.

**IS THE SIZE OF THE LUMINAIRE A PROBLEM?**

No. The Form 206 luminaire is only slightly over six feet long and the distinctive size and shape add functional beauty to the appearance of any street or roadway. No guys or trusses are required to support the luminaire even in high winds.

**WHAT MAINTENANCE IS REQUIRED?**

Maintenance is reduced! The fluorescent lamps used in the Form 206 have an average lamp life of 7500 hours, or about two years of street-lighting operation. The hinged plastic globe is shatterproof and is tightly sealed to prevent dirt or insects entering the unit. Sun, rain, heat, cold, or aging do not adversely affect the plastic globe or the light output.

**HOW DO COSTS COMPARE?**

When over-all lighting costs are computed on an equivalent visibility basis, G-E Form 206 fluorescent luminaires cost less than any other comparable system of filament or color-improved mercury. Although equipment and amortization costs are somewhat higher, installation costs are comparable, and operating costs are generally lower.

**GET MORE INFORMATION** about this outstanding G-E fluorescent luminaire, the Form 206. Contact your nearest G-E Apparatus Sales Office, or write Section 452-139, General Electric Company, Schenectady 5, N. Y.

**SOUTH**—Statesville, North Carolina installed 104 Form 206 fluorescent street lights and was enthusiastic about their visual comfort, economy, and modern appearance.

**WEST**—Virtually glareless illumination and an even light pattern resulted when Seattle installed Form 206 luminaires to light the second level of this new Alaskan Way viaduct.

GENERAL ELECTRIC

# THIS IS A HIGH CURRENT TRANSFORMER BUSHING

**This** assembly does not appear to be very complicated. As a matter of fact, it isn't. Its design represents no masterpiece of engineering ingenuity. No serious troubles are involved in its manufacture. It's a routine "special job"—*for Lapp.*

The point is just that—that such jobs are routine at Lapp. This piece is the result of the inquiry from a transformer manufacturer, "What can you make us in the way of 3200-ampere 2500-volt bushings?"

The assembly, as you see, is trim, neat and functional. Designed to solve a vexing problem, it does its job dependably.

We call your attention to it only because it illustrates the ability and willingness of Lapp to design and produce insulating assemblies to meet specific and unusual conditions. And these are skills and facilities which have been called on so many times over the past 38 years, for solution of so many kinds of problems, that we think we now know how to approach almost any requirement involving high-current and/or high-voltage insulation. Not only in bushings—which we've produced successfully in just about every design known—but also transmission line and station insulators—and other types of special porcelain for America's best manufacturers of equipment.

Lapp Insulator Co., Inc., Le Roy, N. Y.

**Lapp**

# Cost Depreciation Charges Understate Utilities' Expenses

**F. WARREN BROOKS,** Vice-President, Finance, Cleveland Electric Illuminating Co, Cleveland, Ohio

When property of a business is consumed at a long-term rate faster than compensation is provided through the conventional depreciation charges, those depreciation charges understate the actual expenses. This is what is happening today as a result of tremendous inflation.

Utility earnings today are overstated by the amount that depreciation charges fall short of expressing real costs, and the dividends paid are a larger percentage of true earnings than is indicated by the reported pay-out ratio. Some utility companies may be paying out more than 100% of true earnings, thus dissipating capital assets in the guise of distributing dividends.

The commonly used straight-line method of depreciation accounting should charge to each year's operations the costs of a uniform percentage of the total economic consumption over the life of the property. The usual method of determining the dollars annually to be charged fails to consider the actual expense incurred as the assets are consumed whenever the purchasing power of the dollar has undergone a change.

The inadequacy of original cost accounting for depreciation may be illustrated by the following example. A distribution system has 100 poles acquired at $100 each for a total of $10,000. Assuming the average life of poles is 20 years, the straight-line method of depreciation would charge to each year's operation 1/20th of the poles, or five poles. The depreciation charges would be 1/20th of the $10,000 cost, or $500 per year.

Chart I shows what happens when the purchasing power of the dollar declines to 60% of its former level. A new pole now costs $167, and the cost of five poles chargeable to that year's operations would be $833. Depreciation based on original cost, nevertheless, would charge only $500 or $333 less than the number of dollars required to restore to the enterprise the equivalent of five poles.

This understatement of depreciation results in an overstatement of income by the same amount. To conserve a utility's assets, management in fixing dividend policy should consider the portion of depreciation included in its reported income. Pay-out ratio should be low enough to obviate paying out part of capital assets.

**Purchasing Power Trend . . .** Where periods of declining purchasing power are followed by periods of increasing purchasing power, the understatement of depreciation costs would be compensated for by overstatements. For the past 50 years, the trend has been steadily downward.

The Business Executives Research Council of Greater Chicago has summarized the effects of understating depreciation as follows:

1. Basic business decisions, such as pricing and investment, may be based on cost data that reflects past dollars.
2. Wage policies and labor relations may be hampered.
3. Dividend policies and stockholder relations may be adversely affected.
4. Capital is taxed as income or distributed as dividends.

**Determining Real Costs . . .** Determining real cost of depreciation in determining income is simple. Both the mathematics and accounting procedure involve no change in accounting principle. The only change involves adjustment of original cost depreciation dollars to equivalent current-price-level dollars.

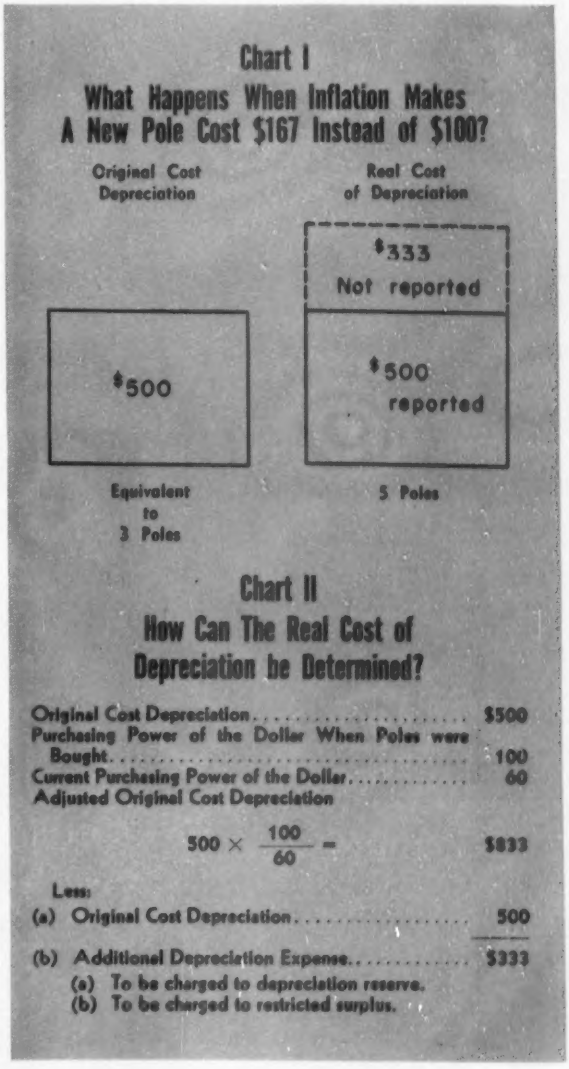
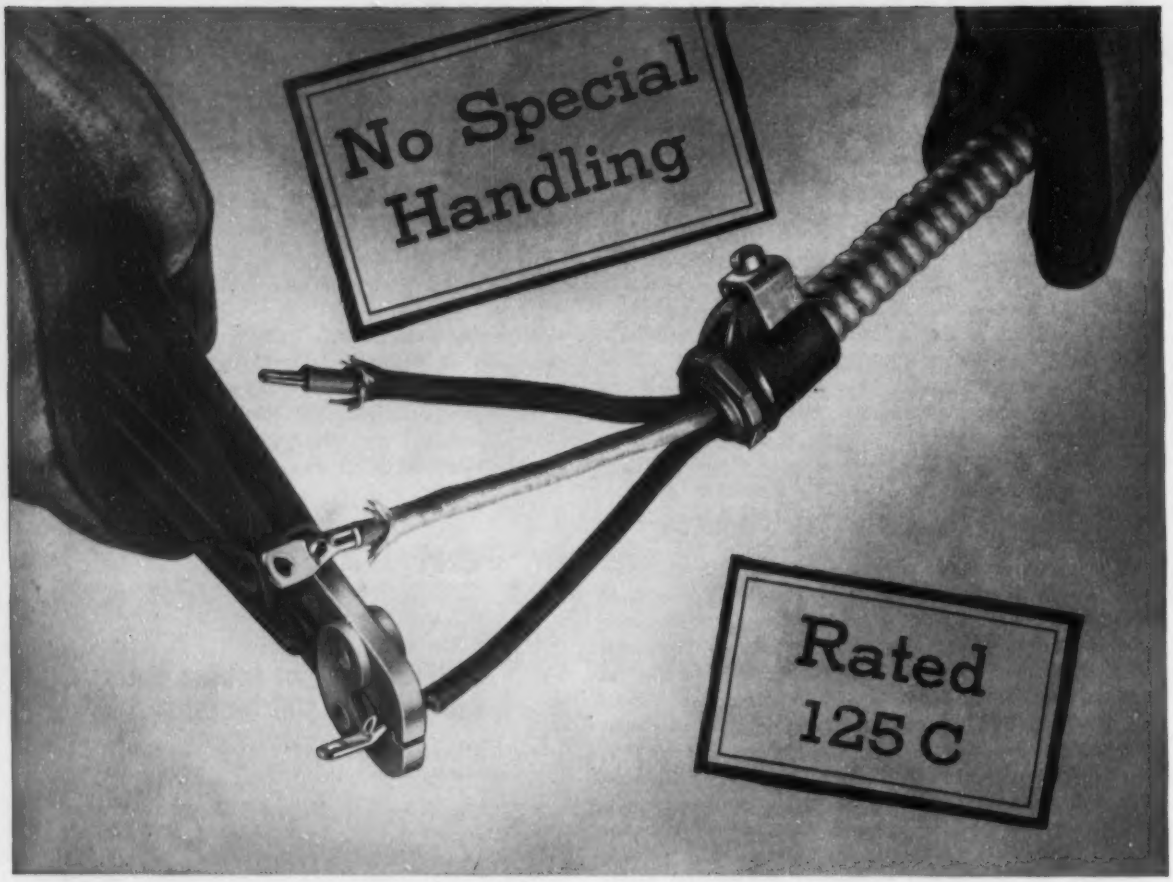


Chart I
What Happens When Inflation Makes A New Pole Cost $167 Instead of $100?
Original Cost Depreciation
Real Cost of Depreciation
$333
Not reported
$500
$500
reported
Equivalent to 3 Poles
5 Poles
Chart II
How Can The Real Cost of Depreciation be Determined?
Original Cost Depreciation ..... $500
Purchasing Power of the Dollar When Poles were Bought ..... 100
Current Purchasing Power of the Dollar ..... 60
Adjusted Original Cost Depreciation
500 × 100/60 = $833
Less:
(a) Original Cost Depreciation ..... 500
(b) Additional Depreciation Expense ..... $333
(a) To be charged to depreciation reserve.
(b) To be charged to restricted surplus.

*Adapted from a paper presented to the New York Society of Security Analysts, April 7, 1954




# NEW G-E CONTROL CABLE WITH SILICONE-RUBBER INSULATION

This new General Electric silicone-rubber-insulated control cable (Type SI-58134) protects vital control circuits against fire. It will maintain circuit integrity under conditions where other control cables often fail. Its 125 C rating adds years to the life of high-temperature installations. Its armor provides added mechanical protection at low cost.

General Electric control cable with silicone-rubber insulation can be handled just like any ordinary rubber-insulated control cable. No special tools or fittings are needed... no special terminations are required. Use it in wet or dry locations.

For more information call your G-E Wire and Cable specialist, or write to Section W126-827, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

Chart II illustrates the change. The annual depreciation charge based on original cost was $500. The purchasing power of the current dollar is 60% of the purchasing power of the original cost dollar. Thus the current dollar equivalent to the original $500, is $500 times the original purchasing power of 100 divided by the current purchasing power of 60, or $833.

**Capital Adjustment . . .** Current accounting credits only the original cost depreciation charges to the depreciation reserve, in this case $500. The proposed accounting method would continue this practice but in addition would credit the excess or deficiency of depreciation adjusted to the current price level to a restricted surplus or similar capital adjustment account in this case $333.

Corporate profits for 1946-52, as reported, were overstated by an average of $3.5-billion per year as a consequence of the understatement of depreciation. The utility industry with its heavy plant requirements has a huge stake in this overstatement of profits.

The major decline in purchasing power has occurred since the end of World War II. These postwar years constitute a small fraction of the total span of utility plant life. Consequently, a large portion of the detrimental effect on the typical utility of delay in recognition of the growing inadequacy of depreciation accruals under inflation has yet to be felt.

Accounting recognition and appropriate reflection in the financial statements would be desirable. They are not essential, however, so long as there is a correct interpretation of income determined under current practices.

The prime areas where recognition is needed are rate regulation and determination of income tax. If rate regulatory and tax authorities allow the full costs of depreciation in determining income, allowed earnings after taxes as reported under current accounting principles would be enough to cover hidden depreciation costs. Such recognition would enable utilities to maintain a pay-out ratio low enough to conserve existing assets while paying adequate dividends.

**Arguments Against . . .** Those opposing recognition argue that allowance of more than original cost depreciation in fixing utility rates or income taxes enables the utility stockholder to benefit from inflation. This benefit is supposed to result through an increase in dollars in the equity account of the balance sheet when inflation occurs, either from a reduced pay-out ratio while maintaining adequate dividends or from dollars charged to a restricted surplus or capital adjustment account.

Evaluation of this argument must consider the appeal of utility common stocks to the investor. Does he invest because he regards it as a bond with relatively stable dividend and reasonable stability in market value, regardless of changes in the value of the dollar? Or, does he invest in anticipation of reasonable maintenance of purchasing power of both dividends and market value through appreciation in market value and dividend increases during a general decline in the dollar's worth.

Also to be considered in such evaluations is the long-term effect on the equity interest. This is evaluated in Chart III which shows the accumulated effect of understating depreciation over the full life of an asset.

It assumes that the price level was stable for three years. In Year 4, inflation depressed the purchasing power of the dollar to 60% of its former level. A new pole now costs $167, the original cost depreciation of $500 being equivalent only to three poles. The second price level continued for the remaining 17 years until all poles were fully depreciated. Over the 20-year period, total poles chargeable were 100. The depreciation charges based on original cost were equivalent to only 66 poles. Of the total eco-

(*Continued on page* 32)

## Chart III

### How Are Assets Dissipated Through Failure to Recognize Total Depreciation?

100 Poles With 20 Year Life

| Year | Purchasing Power of the Dollar | Poles Chargeable | Original Cost Depreciation | Poles Equivalent to Depreciation Charged |
|---|---|---|---|---|
| 1 | 100 | 5 | $500 | 5 |
| 2 | 100 | 5 | 500 | 5 |
| 3 | 100 | 5 | 500 | 5 |
| 4 | 60 | 5 | 500 | 3 |
| 5 | 60 | 5 | 500 | 3 |
| 6 | 60 | 5 | 500 | 3 |
| 7-20 | 60 | 70 | 7,000 | 42 |
| TOTAL | | 100 | $10,000 | 66 |

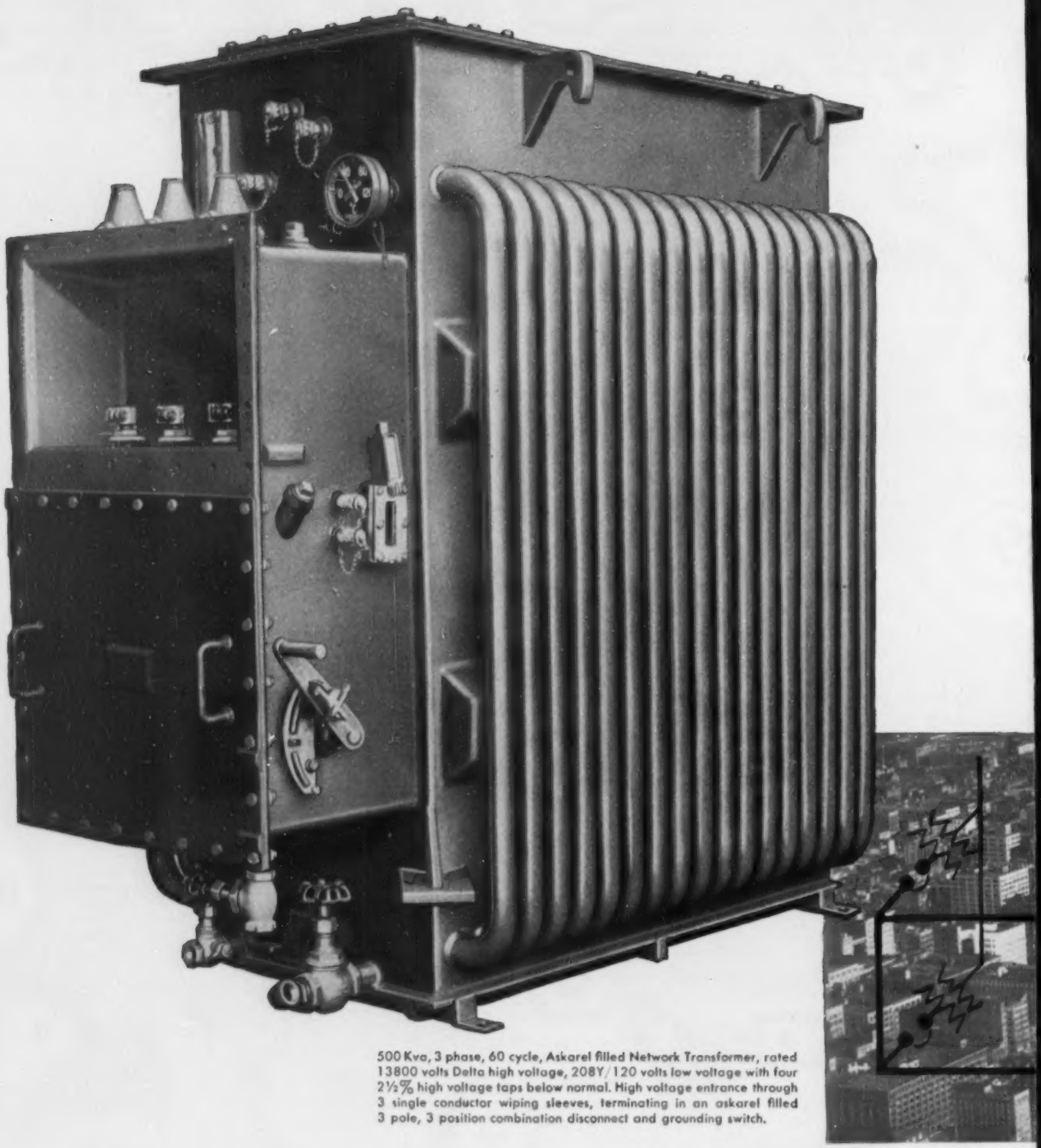
| | |
|---|---|
| Poles Used Up | 100 |
| Poles Charged | 66 |
| Replacements For These Poles Must Be Provided From Retained Earnings Or New Security Sales | 34 |

## Chart IV

### How Can we Account for Capital Exhaustion?

Company With 100% Common Stock

| | Present Accounting Conventions | | Corrected Accounting Conventions |
|---|---|---|---|
| | Millions of Dollars | | Millions of Dollars |
| Revenue | 100 | | 100 |
| Expenses (Incl. Taxes) | 70 | Adjustment Due to | 70 |
| Depreciation (Orig.) Cost Basis | 10 | Change in Value of Dollar | 10<br>4 |
| Return on Earnings | 20 | | 16 |
| Dividends | 13 | | 13 |
| Payout Ratio | 65% | | 81% |
| Market Value (10,000,000 Shares) | 320 | | 320? |
| Price Earnings Ratio | 16 | | 20? |
| Common Equity Stated Value | 200 | | 200 |
| | | Capital Adjustment | 4 |
| Earnings Retained (Beginning of Year) | 70 | (Restricted) | 70 |
| Increment During Year | 7 | | 3 |
| TotalEquity | 277 | | 277 |

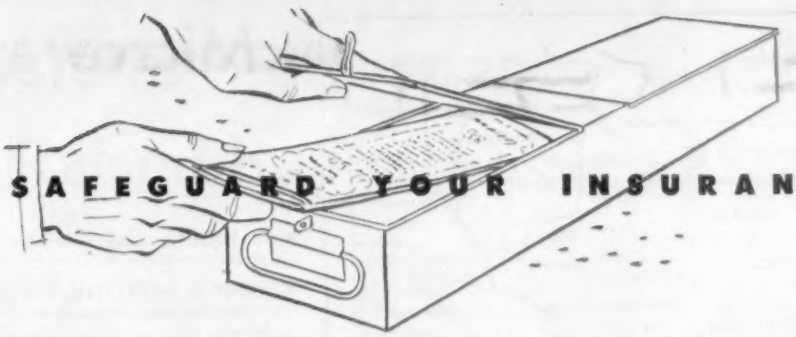


500 Kva, 3 phase, 60 cycle, Askarel filled Network Transformer, rated 13800 volts Delta high voltage, 208Y/120 volts low voltage with four 2½% high voltage taps below normal. High voltage entrance through 3 single conductor wiping sleeves, terminating in an askarel filled 3 pole, 3 position combination disconnect and grounding switch.

**M O L O N E Y  E L E**

*Manufacturers of Power Transformers • Distribution Transformers • Load Ratio*

**FACTORIES AT ST. LOUIS 20, MISSOURI AND TORONTO, .**

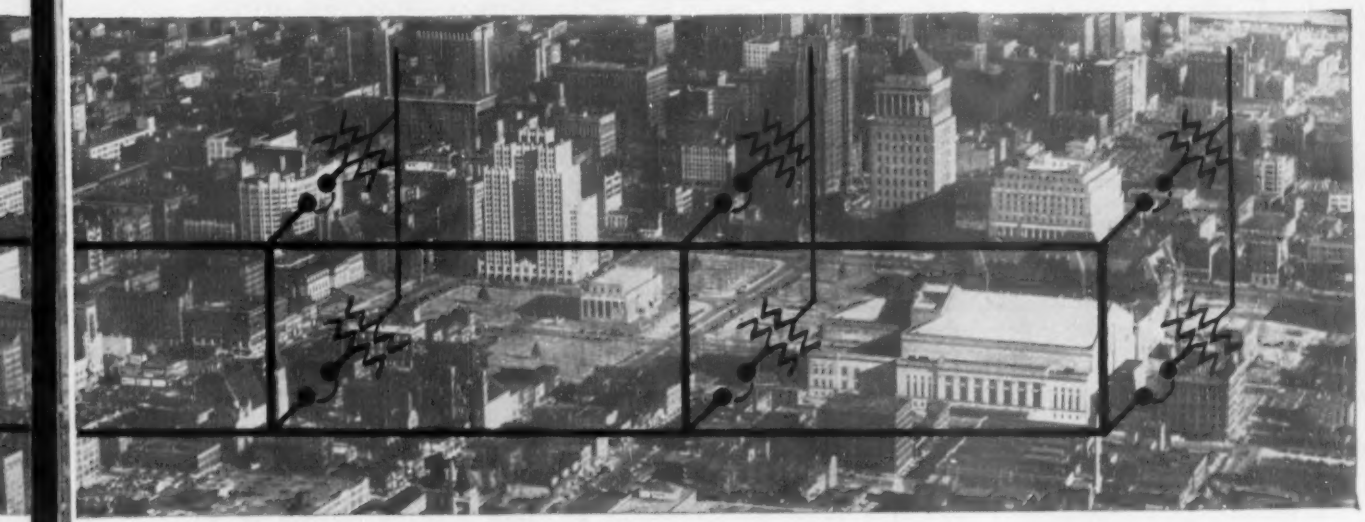


# SAFEGUARD YOUR INSURANCE POLICY

Insurance coverage is defined in the text of a policy. Coverage or lack of coverage is definitely stated. Such policies are put in a safe place, pending need, by far sighted responsible persons.

The basic reason for a network system is to insure continuous operation in the event of unforeseen happenings. This insurance is a wise precaution which is becoming a standard operating practice with most utilities. The best assurance that this insurance is properly protected, is the best equipment. Moloney Network Transformers are designed to operate under unusual and strenuous conditions when necessary. By installing a network system you insure continuous operation even when one part of the system fails. By installing Moloney Network Transformers you doubly insure that the system will function because Moloney Network Transformers are more dependable and less vulnerable to failures.

ME54-6



**C T R I C  C O M P A N Y**

*Control Transformers • Step Voltage Regulators • Unit Substations • Electronic Transformers*

**ONTARIO, CANADA • SALES OFFICES IN ALL PRINCIPAL CITIES**

# Microwave

**E. A. SHULTZ,** Manager of Electric Operations

**HERBERT G. GOERS,** Relay and Communications Engineer, Illinois Power Co., Decatur, Ill.

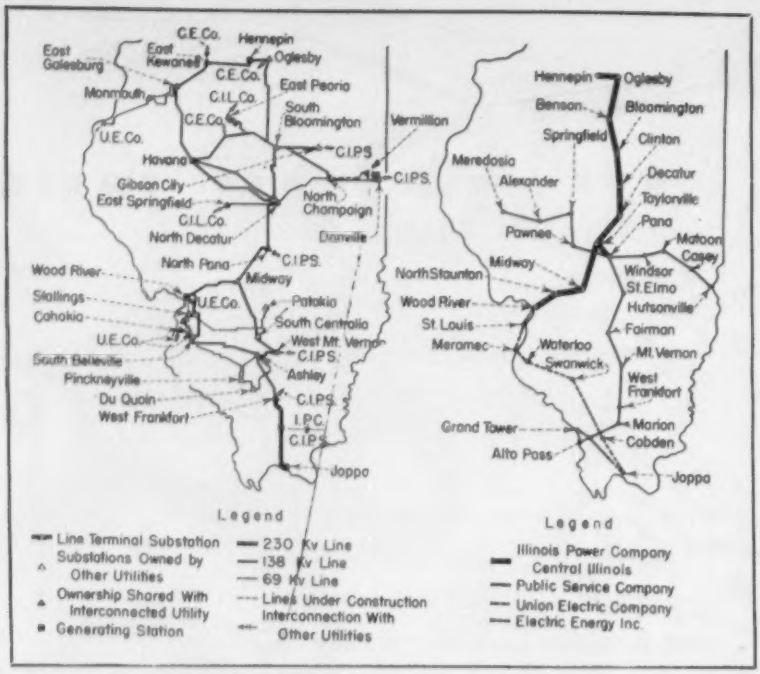



**FIG 1—ILLINOIS POWER CO's system (left) has 1,632 circuit miles of transmission lines. Map at right shows Illinois Power's Decatur-Wood River, Decatur-Hennepin microwave system**

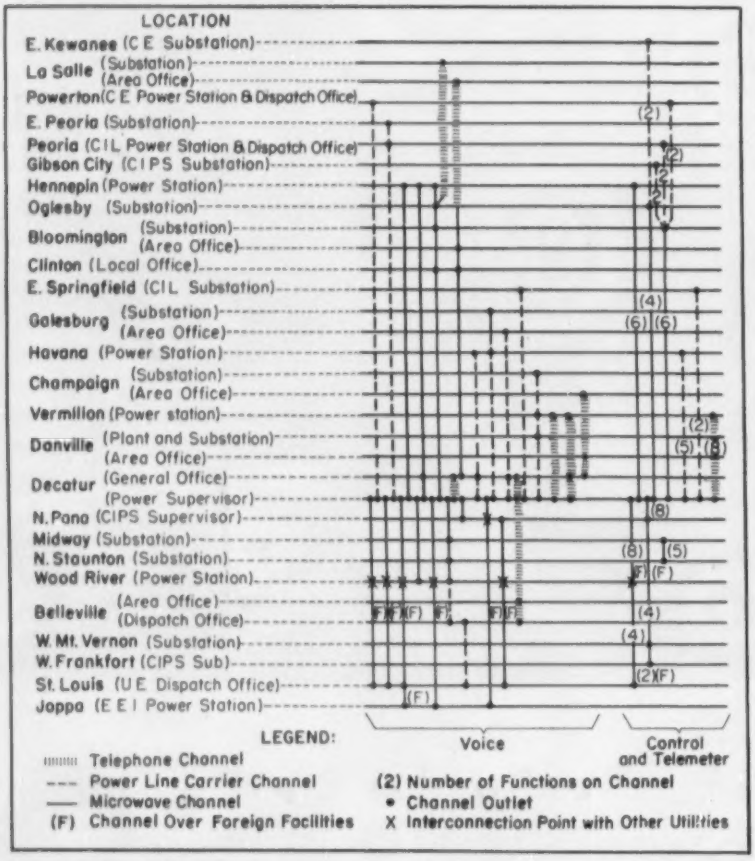

LOCATION
E. Kewanee (C E Substation)
La Salle (Substation) (Area Office)
Powerton (C E Power Station & Dispatch Office)
E. Peoria (Substation)
Peoria (C I L Power Station & Dispatch Office)
Gibson City (C I P S Substation)
Hennepin (Power Station)
Oglesby (Substation)
Bloomington (Substation) (Area Office)
Clinton (Local Office)
E. Springfield (C I L Substation)
Galesburg (Substation) (Area Office)
Havana (Power Station)
Champaign (Substation) (Area Office)
Vermilion (Power station)
Danville (Plant and Substation) (Area Office)
Decatur (General Office) (Power Supervisor)
N. Pana (C I P S Supervisor)
Midway (Substation)
N. Staunton (Substation)
Wood River (Power Station)
Belleville (Area Office) (Dispatch Office)
W. Mt. Vernon (Substation)
W. Frankfort (C I P S Sub)
St. Louis (U E Dispatch Office)
Joppa (E E I Power Station)
Voice
Control and Telemeter
LEGEND:
Telephone Channel
Power Line Carrier Channel
Microwave Channel
(F) Channel Over Foreign Facilities
(2) Number of Functions on Channel
• Channel Outlet
X Interconnection Point with Other Utilities

**FIG 2—MICROWAVE SYSTEM has 1,180 circuit miles of voice channel and 1,460 circuit miles of telemeter and control channels. Other communications are integrated with the system**

The two microwave systems of Illinois Power Co have a very satisfactory record for service continuity largely because of their reliability during storms. This performance was attained by progressive modification of the microwave systems, and further modifications are considered.

Thus far, switchover time has been speeded up, the effects of fading reduced, the alarms system improved, squelch removed from the telemeter subcarrier channels, and provision made for audio level switching of certain channels for ease in sectionalizing to locate troubles.

The microwave systems, shown in Fig 2, have 1,180 circuit miles of voice channel and 1,460 circuit miles of telemeter and control channels. Also in use are 1,400 circuit miles of open wire lines, 310 circuit miles for high-speed relaying, voice communication, supervisory control, telemetering, and tie-line load control.

**Early Operating Experience . . .** During early operation of the Decatur-Wood River system, it took 2 to 3 min for automatic switchover of radio frequency standby equipment and auxiliary power equipment. This transfer time was found to be too great and has been cut to approximately 1 min. While greater reduction is desirable, it would require continuously energizing at full voltage all tube filaments in the standby unit, thus increasing probability of tube failure and consequent unavailability of the unit when needed.

There have been numerous instances of faulty operation of the thermostat sensing devices in the tower light failure alarm system. These devices are mounted on the bulb by a special harness. As the point of con-

Adapted from a paper presented at American Power Conference

# Systems' Performance . . .
# . . . Raised by Progressive Modifications

tact with the bulb is very critical, the tower must be climbed for installation. A newly designed current differential scheme will soon replace these sensors on the Decatur-Wood River system.

Many radio frequency switchovers were experienced in early operation. Investigation revealed that most of these were occasioned by poorly soldered joints on the tube sockets.

Some difficulties have been experienced in sectionalizing trouble because of the complexity of certain channels, interconnected at audio levels between the equipment of two manufacturers. Switching arrangements to permit station operators to make checks are now being installed.

It has been found desirable to remove the squelch from the telemeter subcarrier channels. These channels are operable under weak signal conditions which would not permit their use for voice communication.

**Propagation . . .** The number of fades found in initial operation of the Decatur-Wood River system was disappointing, but a realignment of the reflectors affected a very substantial improvement. Performance is now quite satisfactory although fades are more numerous than expected. Fading is most prevalent between midnight and 8 AM during all but the winter months. It appears to be more pronounced during fog or temperature inversions in the signal path. Voice communication, however, is not seriously affected by fades as they are very short and frequently appear to affect the channel in only one direction.

Fades affect the telemetering and control channels for automatic tie-line load control more than voice channels. During outages the subcarrier receiver outputs contain noise components causing random operation of the audio carrier channel. This results in erroneous telemeter indications, rapid movement of the recorder pen, and trip-off of the automatic load control because of limit switch operation or loss-of-signal relay operation. The recording instruments are liable to damage and loss of sensitivity when the pens swing full scale and hit the stops.

To prevent random operation and recorder damage upon loss of signal, differential squelch circuits and time delay relays are being added to stop the telemeter recorder pen motion when the audio carrier signal is lost.

## Table I—Microwave Channel Outages on Decatur-Wood River System

| Month | Equipment Troubles and Testing | | Fading and Unexplained | | Total | |
|---|---|---|---|---|---|---|
| | Number | Duration (Min) | Number | Duration (Min) | Number | Duration (Min) |
| September 1953 | 4 | 1 | 289 | 133 | 293 | 134 |
| October 1953 | 13 | 282 | 174 | 75 | 187 | 357 |
| November 1953 | 47 | 6 | 25 | 5 | 72 | 11 |
| December 1953 | 9 | 242 | 10 | 6 | 19 | 248 |
| January 1954 | 22 | 25 | 44 | 1 | 66 | 26 |
| Total | 95 | 556 | 542 | 220 | 637 | 776 |
| Percent | 15 | 0.25 | 85 | 0.10 | 100 | 0.35 |

## Table II—Microwave Channel Outages on Decatur-Hennepin System

| Month | Equipment Troubles and Testing | | Fading and Unexplained | | Total | |
|---|---|---|---|---|---|---|
| | Number | Duration (Min) | Number | Duration (Min) | Number | Duration (Min) |
| September 1953 | 28 | 181 | 235 | 88 | 263 | 269 |
| October 1953 | 11 | 28 | 198 | 172 | 209 | 200 |
| November 1953 | 9 | 23 | 11 | 3 | 20 | 26 |
| December 1953 | 66 | 164 | 0 | 0 | 66 | 164 |
| January 1954 | 46 | 72 | 5 | 3 | 51 | 75 |
| Total | 160 | 468 | 449 | 266 | 609 | 734 |
| Percent | 26 | 0.21 | 74 | 0.12 | 100 | 0.33 |

The time delay relay keeps the pen motor circuit open for about 5 sec after the signal is restored to allow the capacitor in the bridge circuit to be recharged and the recorder pen to be repositioned.

Another circuit modification under consideration would add a time delay in the load control trip-off circuit upon loss of audio signal. Most of the control trips resulting from short fades could then be eliminated. The automatic load control, in effect, would continue to operate, detecting no changes in the tie-line interchange value having channel difficulties. In most instances this should be acceptable because the audio signal is on long enough every 3 or 4 min to give the control a "sampling" effect of the actual interchange value. Some control pulses to "raise" or "lower" plant generation may not get through, requiring some plants to regulate more than others during fades.

**System Trouble . . .** Except for a normal amount of tube failure, very little trouble has been experienced with electronic equipment. On audio carrier impulse telemeter channels, welding of the carrier receiver relay contacts has resulted from the high current drawn by the telemeter receiver input dc relay. A simple spark suppressor is expected to correct this trouble.

Besides the few instances of trouble with electronic equipment, the gasoline engine on the ac standby supply at one station failed to start during a routine weekly check. Water in the gasoline was the cause. Special nonleaded white gasoline with low gum content is now used without fouling the carburetor.

**Continuity . . .** The tables show the number and duration of outages during the five-month period ending Jan. 31, 1954. Both systems had been in service for some time prior to September 1953, so that the tabulation reflects outages in normal operation after the troubles incident to initial operation had been taken care of.

The Decatur-Wood River system was out of service a total of 776 min, or 0.35% of the time. This represents an availability factor of 99.65. One 4-hr outage, when power supply failure was coupled with failure of the standby engine generator to start, accounts for more than one third of this time. The outages due to equipment failure and testing amount to 0.25%, and fading and unexplained outages to 0.10%.

The Decatur-Hennepin system was out of service a total of 734 min, or 0.33% of the time, providing an availability factor of 99.67. Outages because of equipment failure and testing amount to 0.21% of the time, and fading and unexplained outages to 0.12%.

## Depreciation

(*Continued from page* 27)

nomic consumption of property which occurred an amount equivalent to 34 poles was not charged to operational expense.

**Dilution of Assets . . .** To stay in business, a utility must restore to the enterprise the value represented by these poles.

Dollars to purchase replacement poles or otherwise restore equivalent value come from two places. Either earnings equivalent to 34 poles must be retained, or additional securities must be sold. When additional stock is sold each new share represents fewer physical assets: There is a dilution of the owner's assets.

Chart IV illustrates the finances of a company with revenues of $100 million and expenses, excluding depreciation, of $70 million. The depreciation expense of $10 million is based on original cost principles. With 100% common stock and depreciation reported under present accounting conventions, return or earnings would be $20 million.

Assuming the deficiency of original cost depreciation is $4 million, accounting for this added cost results in reported earnings at $16 million instead of $20 million. If the company paid $13 million in dividends, the pay-out ratio would be 65%. After correction in accounting practices it would be 81%.

If the market value of 10 million shares were $320 million under present accounting methods, would the market appraise the common stock any differently under the changed accounting? Would the market value still be $320 million when the added cost of depreciation, because of a change in the purchasing power of the dollar, was reported and reported earnings proportionately reduced? When the price-earnings ratio is at 16, would a ratio of 20 be reasonable to expect under the corrected practices?

Total common equity is the same, regardless of method. But the corrected method provides a breakdown of the increment of $7 million during the year into a capital adjustment amount of $4 million and an increment to earnings retained amounting to $3 million instead of reporting the entire total as the figure for retained earnings.

The answer to the questions as to the price earnings ratio at which the equity securities would be appraised in the markets after correction of the accounting will determine the extent of revenue correction needed to provide for the added costs of depreciation and still provide a fair return on the investment.

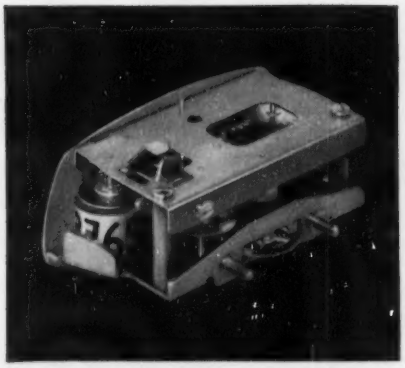
## 6-Year Power Expansion Planned in Great Britain

LONDON — (McGraw - Hill World News) To meet the increasing demands for electric power needed to turn the wheels of British industry, British Electricity Authority has announced plans to increase installed generating capacity in the United Kingdom some 10 million kw between now and 1960. By then BEA figures UK power supplied at the grids will have risen from a current annual rate of about 65 billion kwhr a year to over 90 billion.

Included in its expansion plans is a new giant thermal power station housing 200,000-kw turbo-generator sets. One of these units alone will produce more power than the whole of the existing hydroelectric plants of the North of Scotland Hydro-Electric Board. Also projected is an atomic power station using standard 60,000-kw generating units. In 20 years, BEA figures it will have atomic power plants producing electricity equivalent to that which would be gotten from 20-million tons of coal annually.

An integral part of Britain's power development is, of course, its well-known super-grid. This is due to be completed in eight years and will involve the construction of 2,500 circuit-miles of 275-kv line and 27 major distributing stations.

# Westinghouse Cyclometer Register Easier to Read



Precision workmanship and sturdy construction identify the Westinghouse cyclometer register for CS and CA meters.

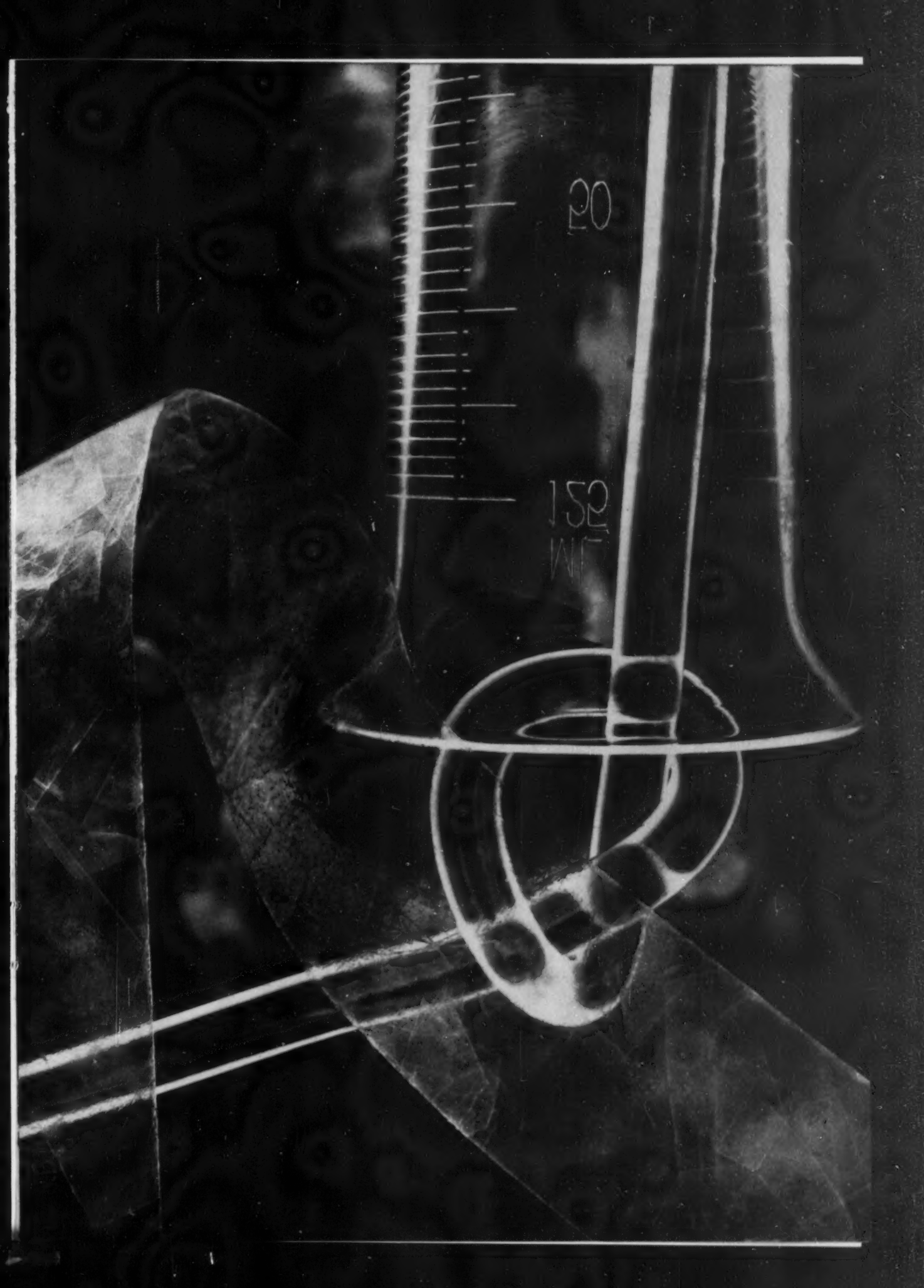
Larger numerals on a permanent white background give this improved Westinghouse cyclometer register far superior readability. Partially obscured figures have been eliminated by providing for "jump" advance of all four drums.

The cyclometer register shown can be supplied on all Type CS and CA meters and is interchangeable with all registers previously used on these meters. The register resets quickly and easily. All gears are precision milled for accuracy . . . and gold finished for corrosion protection.

Your Westinghouse representative has additional information on the new cyclometer register. Ask him for a copy of B-5846-A or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-40478

YOU CAN BE SURE...IF IT'S

Westinghouse


150
125

*Helping the industry meet its growing loads*

# *Thermalastic*... insulation with a memory*

Thermalastic insulation is the latest magic of industrial chemistry to achieve practical application in large motors and generators. Heat it . . . cool it . . . cycle it again, Thermalastic remembers the copper to which it is applied and stays with it. Stretching does not affect its properties and it will always return exactly to its original shape.

The scope of this development challenges the imagination. Thermalastic insulation offers the industry new freedom from shutdowns caused by insulation failure.

Most insulating materials in common use today are considered excellent. But imagine the inherent protection, the vastly improved reliability, in equipment having Thermalastic insulation . . . with its superior thermal stability, outstanding moisture resistance and inertness to chemical contamination and dirt! The high voltage endurance of Thermalastic increases "time to failure" many hundred fold.

The basic materials in Thermalastic insulation are well known, their characteristics proved. The contribution of chemistry has been the development of a synthetic resin that contains the same elements as natural resin with an important molecular change. That, plus a new application technique, produces distinctive qualities that utilize fully the high insulating value of large mica flakes, and maintains them throughout the endless heat cycling that windings must endure. Thermalastic insulation will always hug its copper. It will never migrate or become brittle with age.

Evolved in the minds of engineers, developed in the laboratory, made practical on the production line, Thermalastic insulation is an outstanding example of the progress that Westinghouse offers to help you meet America's power needs.

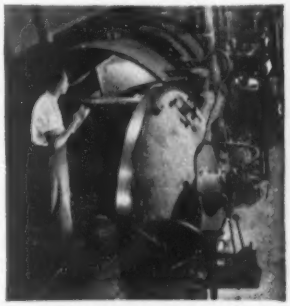
*Trade-Mark J-97176

YOU CAN BE SURE... IF IT'S Westinghouse

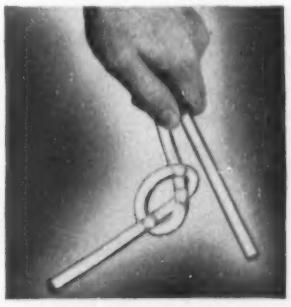
## *Thermalastic insulation*

A chemist's skill at synthesizing, plus an application technique, adds wonderful new qualities to time-proved insulating materials.

Large mica flakes are built into a resilient, flexible tape that can be wound in smooth layers, providing the highest insulating qualities known.



The synthesized resin, having low viscosity, can be made to penetrate the mica completely, leaving no voids between layers, or between mica and copper. Thermosetting, it creates no voids, will not melt.



Infinitely elastic, chemically inert, the resin will hold the mica tight to its copper regardless of heat cycling or overload. Unaffected by moisture, it will never become brittle with age.

FREDERICK C. GARDNER

T. C. WESCOTT

# Ebasco Upgrades Top Officers

## Frederick C. Gardner elected president and chief executive officer, succeeding T. C. Wescott who becomes vice chairman

Ebasco Services, Inc, has promoted Frederick C. Gardner from executive vice president to president and chief executive officer, succeeding T. C. Wescott who has been named vice chairman of the board.

**Ebasco Employee Since 1917 . . .** Gardner has been working continuously for Ebasco or its associated companies since his graduation from North Carolina State College in 1917, when he became a draftsman on investigation of hydroelectric power sites in North Carolina.

After serving as construction engineer in Pennsylvania, Gardner came to the New York office in 1929, assisting in the supervision of construction activities. In 1939 he was made head of the new Design and Construction Division. He became engineering manager four years later and in 1945 was appointed vice president. He has been executive vice president of Ebasco since 1952.

Gardner is a vice president and director of Ebasco de Venezuela, Ebasco Engineering Corp, and the Two Rector Street Corp, and a director of Overseas Consultants, Inc. He is a member of the Board of Management of the Engineers Club of New York and a member of the American Society of Civil Engineers.

**Joined EB&S in 1911 . . .** Wescott served as president and director of Ebasco since 1945. He joined the Electric Bond & Share Co in 1911 as resident engineer on power systems in North Carolina, Texas, Oregon, and Idaho. He came to the New York office in 1914 in charge of investigating hydro sites in North and South Carolina.

Wescott served as construction manager in the New York office from 1924 to 1931. He was elected vice president and director of Ebasco Services in 1938 and at present is a director of the Electric Bond & Share Co.

## Pepco Makes Changes In Its Organization

Potomac Electric Power Co has made three changes in its organization. Harry W. Dannettell, Jr, has been appointed assistant manager, Distribution Department; William E. Peaslee, superintendent of station construction division of the Electrical Engineering Department, and Norman F. Danis, general foreman of the Station Construction Division.

Dannettell has been with the company 19 years and was appointed assistant to the superintendent of the Distribution Department in July, 1952.

Peaslee has been in the Station Construction Division since joining the company in 1922 and was assistant to superintendent, station construction, at the time he received his latest promotion.

Danis was employed by Pepco in 1919 and was serving as a foreman in the station construction division at the time of his appointment as general foreman.

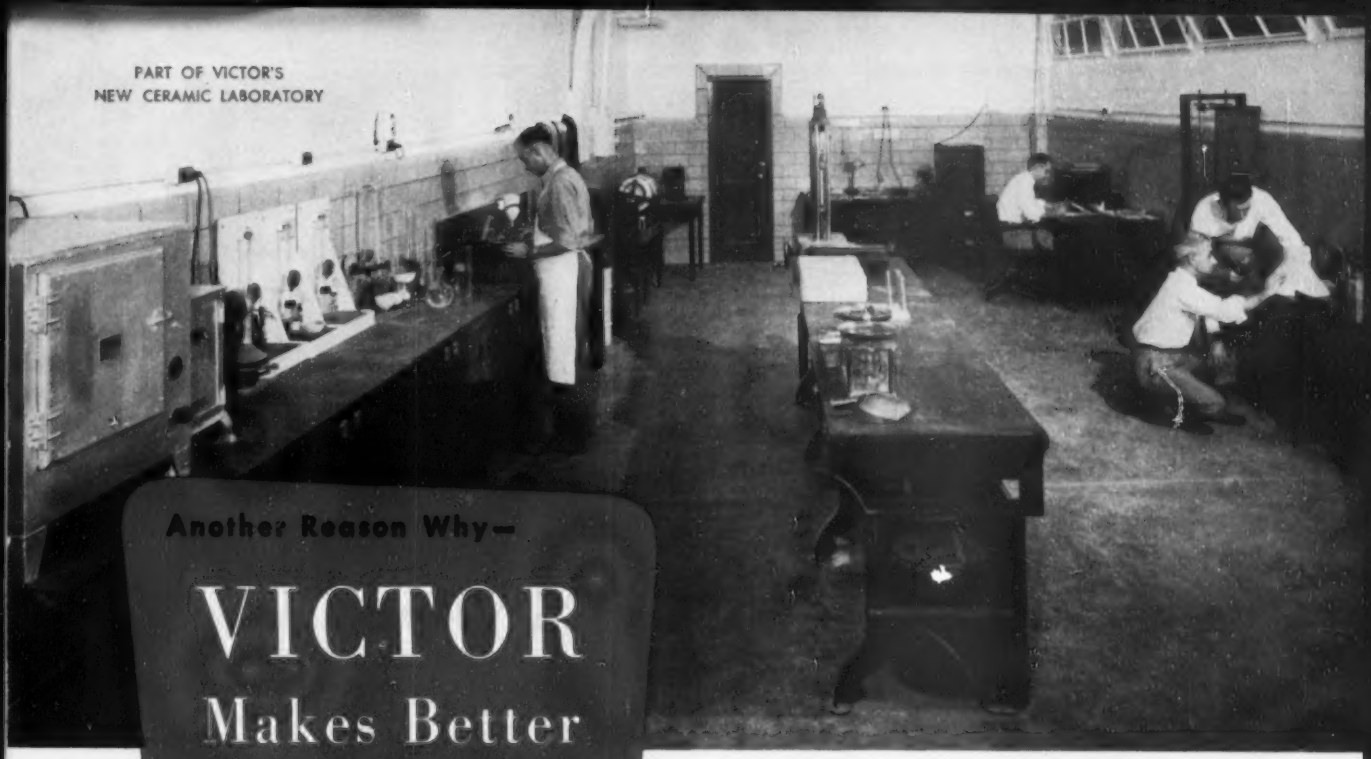
•

**R. H. Ashworth,** a vice president of Utah Power & Light Co, has retired after 41 years with the firm. He joined the company in 1913 in the statistical department. He later became assistant to the general superintendent and soon after assistant to the general manager. He then moved to the post of assistant to the commercial manager and became commercial manager himself shortly thereafter. In 1947 Ashworth was elected vice president in charge of business development and division operations.

**Milton S. Angier** has been named product manager of heat pumps for the Air Conditioning Division of the Westinghouse Electric Corp. He joined Westinghouse in 1924 following his graduation from the University of Illinois. During his 25 years with the company, he has served in various sales and managerial positions.

**Malcolm F. Orton,** director of the Utilities Division of the New York State Public Service Commission, has retired after 24 years of service. He came to the commission in 1930 and served as chief and later as director of the Bureau of Research and Valuation. In 1951, upon reorganization of the PSC, Orton was appointed to the newly created post of director of the Utilities Division.

Allis-Chalmers Manufacturing Co has made these appointments: **Thomas C. Knudsen,** assistant to the general manager in charge of the mechanical product development laboratory; **Vernon B. Honsinger,** assistant to the general manager in charge of the electrical product development laboratory; and **Dwight H. Lory,** manager of the Texrope Drive Section.



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THE unequalled quality of VICTOR *Purified* Porcelain Insulators didn't just happen. It is the result of many years of research and experimentation in one of the industry's finest, most completely equipped ceramic laboratories. It is at VICTOR that many of the milestones in insulator progress such as infra-red drying, "black light" inspection and *Purified Porcelain* have originated. Because of VICTOR's continuing program of research, you can be sure that *IF* still better insulators can be made, they'll be VICTOR!

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Specify **VICTOR**
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Low and High Voltage Pintypes • Suspensions • Guy Strains • Spools • Switch and Bus Insulators
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HOWARD D. TINDALL

DONALD E. SPACKLER

EDWARD F. CLASSEN

# Moloney Electric Appoints 3 VP's

Moloney Electric Co has made several personnel changes in its top organization. Howard D. Tindall has been elected assistant chief engineer and vice president. Donald E. Spackler and Edward F. Classen have been appointed vice presidents. Carl Hellweg has been named director of purchases and Fred J. Connell, district sales manager of the St. Louis office of the company.

**New Sales Office . . .** The company also announced the opening of a district sales office in Chattanooga, with the appointment of Harry S. Thomas to serve as district sales manager.

Tindall joined Moloney in 1940 as a design and development engineer. He has been instrumental in the development of the company's dry-type transformers.

Spackler became a member of the sales department of the company in 1950. He was subsequently employed in the St. Louis plant and Chicago district sales office.

After completing his education at Southern Methodist University and Washington University of St. Louis, Classen was employed by the Emerson Electric Co and McDonnell Aircraft Corp of St. Louis prior to coming with Moloney in June 1950.

Hellweg has been with the company for 26 years and has seen service in practically every department of manufacture. Connell joined Moloney as director of purchases in December, 1945. Previously he had been employed by the Westinghouse Electric Supply Co for over 12 years. Thomas was formerly a district manager of the Jersey Central Power & Light Co. Before his recent appointment, he served as an agent for Moloney with the Engineer Sales Corp of St. Petersburg, Fla.

## Made Assistant VP

T. Peter Dalton, personnel manager of the Shawinigan Water & Power Co for the last seven years, has been made an assistant vice president. He joined the company in 1918. Succeeding Dalton as personnel manager is David E. Ellis, who has been assistant manager of the personnel department.

•

**Robert W. Greenleaf,** vice president of Iowa Southern Utilities Co, has been elected a director of that company.

**Frank M. Lewis,** Bonneville Dam project engineer for the last eight years, will transfer this month from the Portland District of the Corps of Engineers to the Operations and Maintenance Branch of the North Pacific Division. He will be coordinator of the operation of maintenance of the Army Corps' multipurpose projects in the Pacific Northwest.

**Marshall G. Hardesty,** auditor, Iowa Electric Light & Power Co, and **Robert G. Olmsted,** vice president-financial, Long Island Lighting Co, have been elected to membership in the Controllers Institute of America.

**William L. Fraser** has been named project manager of the new Sir Adam Beck generating plant No. 2 at Niagara Falls, Ont., of the Hydro-Electric Power Commission of Ontario.

**Arthur Z. Barnes,** southwestern district manager of General Cable Corp, has been elected assistant to the president. He first joined the company in 1929 as Dallas district sales manager.

## OBITUARY

**Charles G. Pyle,** executive director of National Association of Electrical Distributors, died on July 16 after an illness of several months. He was employed for 24 years by the Sylvania Electric Co, attaining the position of general sales manager before he resigned to join National Electrical Wholesalers Association in 1942 as managing director. During his tenure the organization was renamed NAED.

**E. S. Foster,** 75, chief engineer of instrument transformers of the Standard Transformer Co, died recently. He had been with Standard for past 14 years working on instrument transformer design. Previously he was with Electric Controller Manufacturing Co.

it's time for a new meter...

when Mrs. Riley...

gets her electric range

Since the day she took up the role of homemaker, Edith Riley has had a gas stove, of one kind or another, in her kitchen. But times have changed, and, well . . . the Rileys are getting an electric range this time.

The Rileys, and the thousands of American families like them who are turning to electricity to do more and more things, are going to need high capacity meters.

There is a new extended range meter on the market that will easily handle the heavier loads created by the rapidly increasing use of electricity. It's the Sangamo J2, a 15 ampere meter with straight-line accuracy up to 100 amperes. As a matter of fact, the J2 has the capacity to carry 100 amperes *continuously* without overheating, yet it has sufficient torque to accurately measure even the lightest load.

When you invest money in meters you know are going to have to handle greater and greater loads, protect your investment by choosing a meter with plenty of reserve ability to measure the growing use of electricity.

Choose the new Sangamo J2—the first . . . and finest . . . 15 ampere meter with 100 ampere capacity.

*A METER WITH STRAIGHT LINE ACCURACY*

*UP TO 100 AMPERES*

**SANGAMO**
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM5A-7

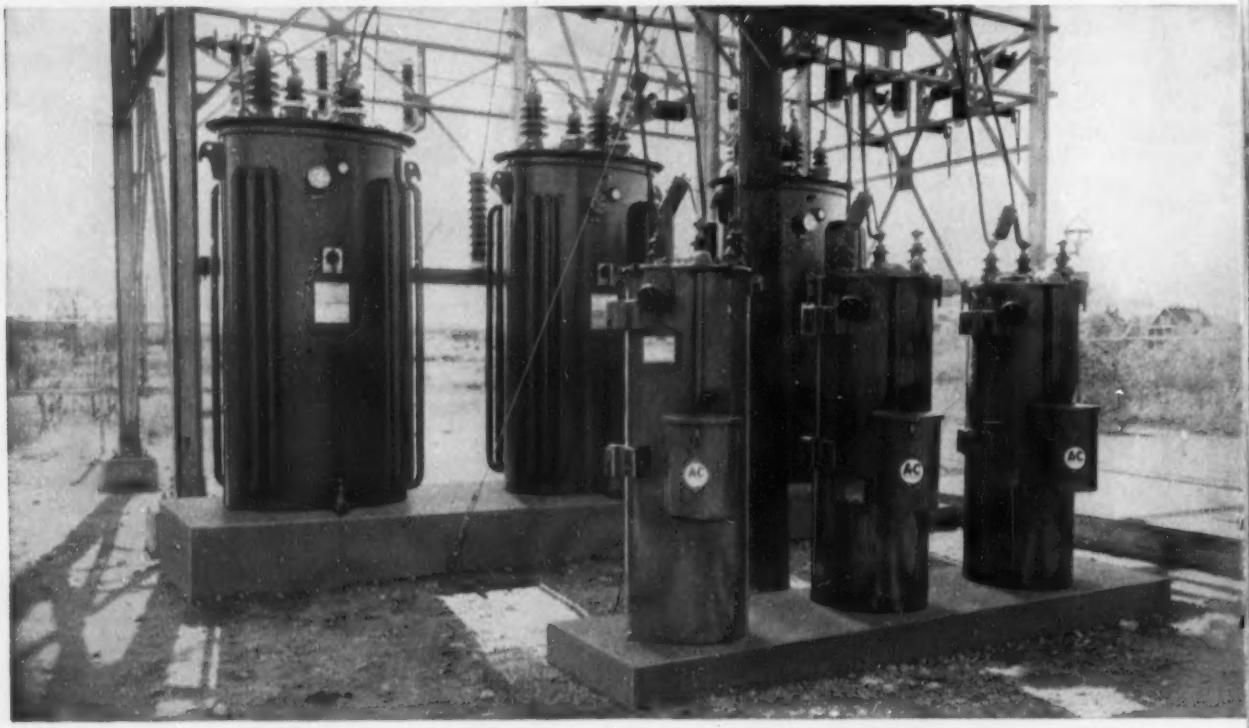
# Is Poor Voltage *Cutting*

HERE'S HOW poor voltage cuts into system revenue: if voltage is only 2.5% low on a 1000-kva yearly peak load, revenue drops as much as $600 per year. Ten percent low voltage costs as much as $4500 in revenue. And it's all a direct loss in profits. Return on system investment is far below what you can get with proper voltages. The chart at right tells the complete story for a typical system.

How can you turn this lost revenue into profits? An easy-to-install answer is an Allis-Chalmers distribution regulator. It will not only keep voltage up, it will pay its own way — out of increased revenue — in as little as two years. After that, all increases in revenue are pure profit to your system.

Allis-Chalmers distribution regulators are a particularly wise choice. Twenty years' experience with their rugged, reliable design has proved it. Hundreds of distribution men will tell you from their own experience of their accuracy and reliability.

Field-proved design, rugged construction, and simplified installation and maintenance add up to a regulator that can turn lost revenue into real profits. Get all the facts on Allis-Chalmers distribution regulators. Call your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wisconsin.



**ALLIS-**

# Your System *Revenue?*

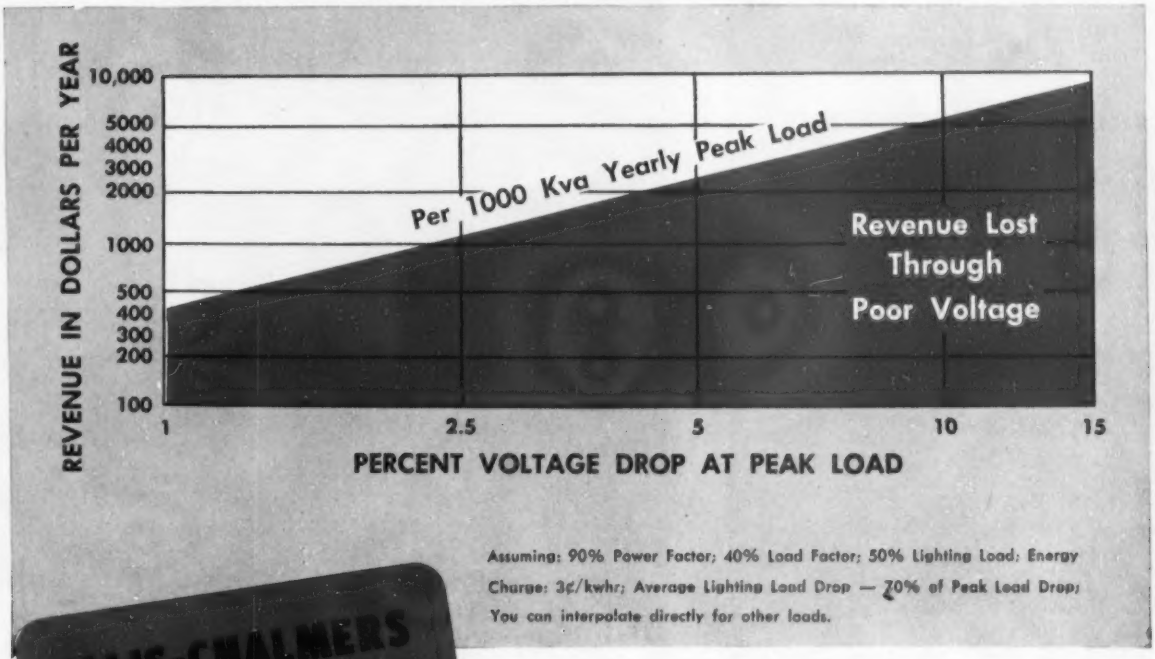



Chart shows revenue losses when voltage is poor on a typical distribution line.

## ALLIS-CHALMERS 5/8% STEP VOLTAGE REGULATORS

### Field-Proved Mechanism

You get a time-tested mechanism in Allis-Chalmers distribution regulators. For twenty years in thousands of applications this mechanism design has proved itself as the most efficient means of changing taps under load. Laboratory tests show it can withstand over five million operations.

### Long-Life Contacts

An important reason why you get satisfactory regulation with a minimum of trouble from A-C distribution regulators is their long-life contacts. Made of arc-resisting materials, contacts are of large size. Laboratory tests prove that they can stand up under the equivalent of forty years of normal operation.

### Unit Construction

You get assurance of years of satisfactory service from A-C distribution regulators because of unit construction. All connections are made and thoroughly inspected before tanking — assuring top-quality workmanship. Same feature makes untanking and inspection easy because core, coils, cover, and control form a single unit.

### Simplified Maintenance

You don't need highly trained servicemen to handle Allis-Chalmers distribution regulators. Take the control, for example. It is simple. Knobs are calibrated and easy to adjust. If needed, you can remove and replace the entire control merely by pulling a single jack plug — there are no other connections to break.

A-4415

# CHALMERS

**Three handy ways of storing overhead lines material are shown at the right**

**Drums** of steel, capacity 55 gal

# Detroit Edison Tests New Methods

**Manufacturers cooperate by shipping items in large metal containers which can be stored outdoors instead of many smaller paper boxes which offer no protection from the weather and increase handling and storage costs of the utility**

Entirely new concepts of packaging, handling, storing, and disbursing of materials for overhead lines are being developed and tested jointly by the Purchasing and Stores Departments of Detroit Edison Co. The company recently centralized at one warehouse most of its storage and disbursement of overhead lines material. The problems involved in developing the concentrated activity suggested many of the innovations.

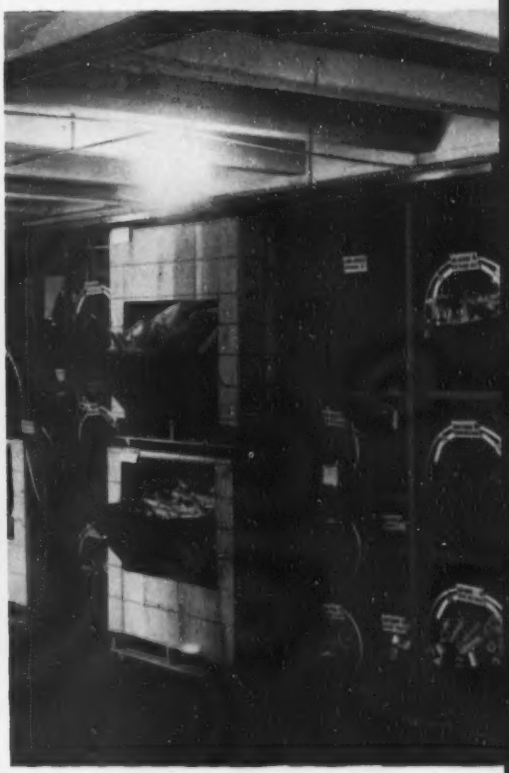
Because the company was handling a large amount of material at one location, it felt the need for larger containers to reduce handling and storage costs. The standard packing is satisfactory for the small user, but the large user has to handle thousands of small boxes and containers of all shapes and sizes which do not lend themselves to rapid mechanical handling. Furthermore, the disposal of the large quantity of empty boxes is an expensive operation.

Detroit Edison's aim was to reduce the number of sizes of containers to a minimum and yet not have more than 30 days' supply in any one container. For ease of handling, it was also considered desirable to limit the weight to 2,000 lb. Another requirement was that the container would permit storage outdoors. It was hoped that these things could be accomplished without increasing the costs of any items.

The study proved that almost all of the materials can be packaged and shipped in two sizes of containers: a 55-gal steel drum and an 8-gal steel pail. For other items for which these containers are not satisfactory, the company has built some 42 by 42 by 38-in. wood pallet boxes.

The drum is of standard design with a clamp-on waterproof cover which protects the contents from corrosion

**Pails** of steel, capacity 8 gal



**Pallet Boxes** of wood, 42 x 42 x 38 in.

# of Storing and Handling Materials

when stored outdoors. Ribs on the sides of the drum facilitate its handling by fork lift trucks. The pail has handles rather than a bail and also has a clamp-on waterproof cover. The wood pallet boxes can also be handled by fork lift trucks and can be stacked two or three high.

Materials brought in from outdoor storage are dispensed directly from the shipping containers. The covers are removed from the drums and pails, and hoppers, designed by company employees and built in company shops, are installed. Hoppers are also installed on the pallet boxes. Purpose of the hoppers is to permit easy removal of items and prevent spillage.

The containers are then placed by fork truck in disbursing racks arranged back to back. Materials are arranged in the racks in the same sequence as they appear on the bills of material. It is expected that nine out of ten bills of material can be filled completely from Detroit Edison's supermarket.

Adapting materials to the pallet box has brought about other packaging modifications which are being suggested to vendors. For instance, street lighting luminaires are now being received in rectangular cartons. Thirty can be stored in the pallet box. By using a triangular carton 60 can be placed in the same box. This same triangular carton has been suggested for other items, such as lightning arresters and fuse carriers. One vendor has stated that he expects to cut his packaging costs 50% by adopting the suggestion.

Advantages to Detroit Edison of the new system are these:

1. Savings are effected by reduced handling through greater use of lift trucks.

2. Material orders are filled faster.

3. Storage in drums and pails keeps material in new condition even when stored outdoors.

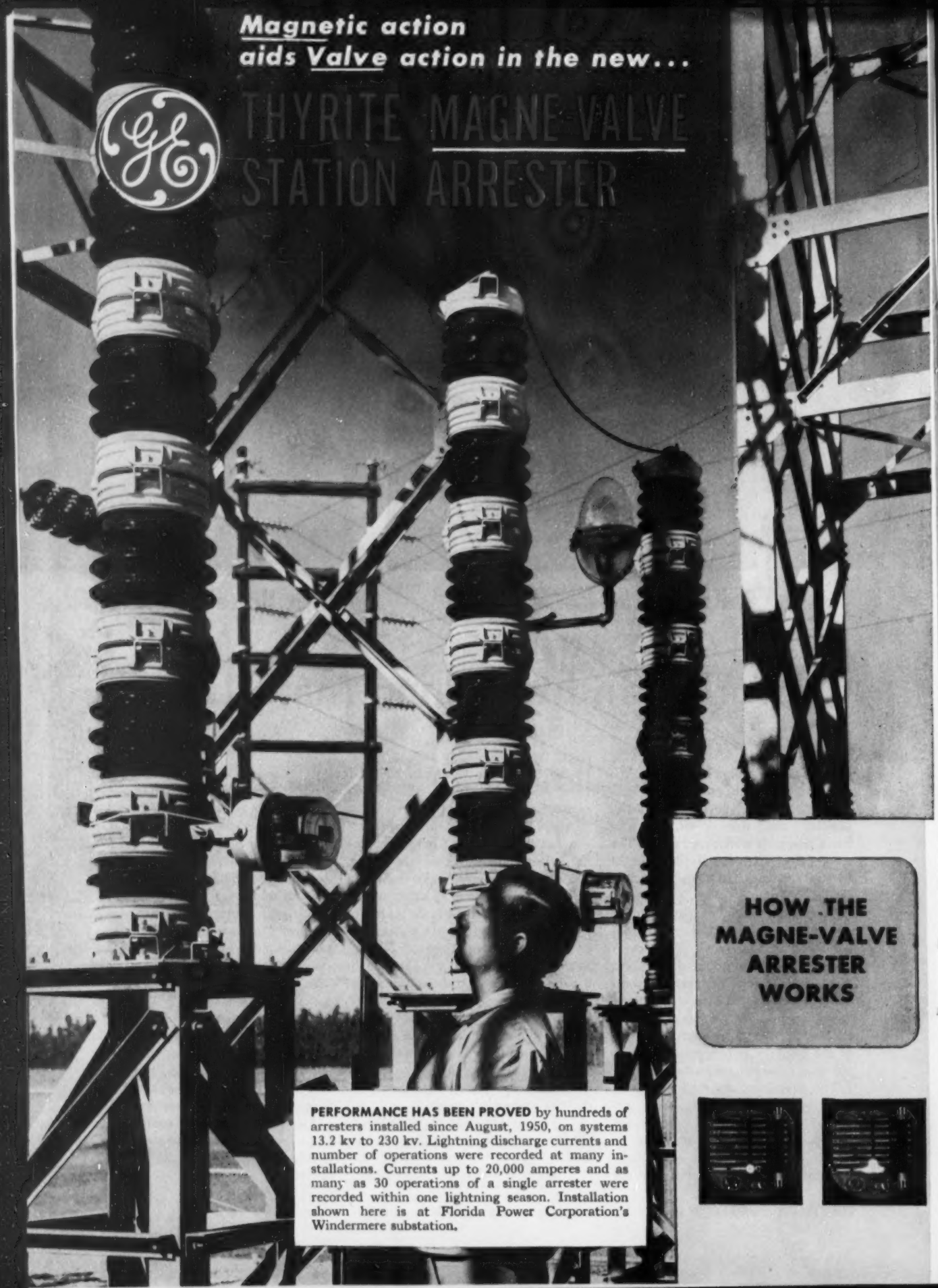
4. Outdoor storage reduces need for warehouses.

5. Storage in larger, well-marked containers facilitates more accurate and faster physical inventories.

6. Steel drums and pails when emptied can be used for many other purposes, such as reshipment of materials, salvage of removal items, etc. The wooden box can also be used in a number of ways.

The vendors who have offered no objections to the system also profit. They save time and labor in packing and loading for shipping. The actual cost of the drums in most cases is less than for the boxes they replace.

Further studies are being made, and it is believed that they will reveal additional advantages in efficient operation.


Magnetic action
aids Valve action in the new...
THYRITE MAGNE-VALVE
STATION ARRESTER
HOW THE MAGNE-VALVE ARRESTER WORKS
PERFORMANCE HAS BEEN PROVED by hundreds of arresters installed since August, 1950, on systems 13.2 kv to 230 kv. Lightning discharge currents and number of operations were recorded at many installations. Currents up to 20,000 amperes and as many as 30 operations of a single arrester were recorded within one lightning season. Installation shown here is at Florida Power Corporation's Windermere substation.

# 20% better protective level
# 3 times greater endurance

The new Thyrite* Magne-valve arrester is a major advance in reliability of co-ordinated protection of station apparatus. Let's appraise it!

**FOR APPARATUS HAVING STANDARD BIL'S—**

You get an unprecedented margin of protection that assures co-ordinated protection for many times higher stroke currents—even 100,000 amperes. This super-protection is especially valuable where lines or substations are not shielded or where practicable shielding may not be infallible.

You get an extra margin of protection which tends to offset adverse effects of separation between arrester and apparatus—enabling co-ordinated protection to apparatus at greater distances from the arrester.

**FOR H-V APPARATUS HAVING REDUCED INSULATION—**

You get as large a margin of safety in protecting 1-step reduced BIL insulation as was heretofore possible only when protecting full insulation (standard BIL). Hence, the new arrester enables a more positive approach toward reduced insulation and resulting tremendous savings in apparatus investments.

**FOR DRY-TYPE TRANSFORMERS—**

You get a good margin of protection—heretofore limited. Although oil- or askarel-filled transformers are distinctly preferable for connection to lines exposed to lightning, the decidedly lower impulse strength of dry-type transformers can now be better protected.

**FOR APPARATUS HAVING DEPRECIATED INSULATION—**

You get more positive protection—to preserve and greatly extend the operating life of old but important apparatus.

**Reg. Trademark of General Electric Co.*

**FOR AC ROTATING MACHINES—**

You get as good margin of protection to even impedance-grounded neutral rotating machines using ungrounded-neutral 100% rating arresters, as was heretofore practicable with only grounded-neutral 80% rating arrester. And for grounded-neutral machines, you can now limit the lightning stresses to 80% of the machine's 1-minute hi-pot test level. Both are important achievements for better protection of generators, synchronous condensers, and motors, alike.

**FOR ALL THESE APPLICATIONS—**

You get full-fledged uncompromised ***station*** arrester protection—6-inch diameter low-resistance Thyrite valve-disk with exclusive integrally fired ceramic insulating collar, the most efficient valve element ever offered.

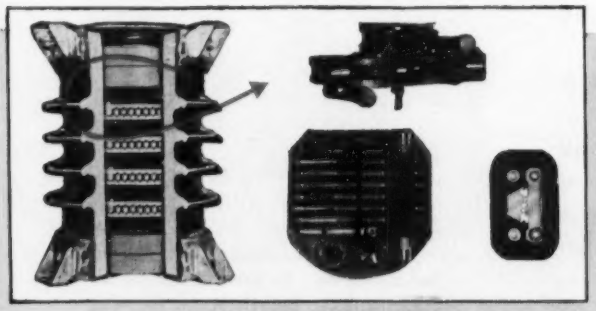
You get straight-in-line, low-resistance discharge path—28 sq. inches of cross-sectional area, with no tortuous up-and-down impedance.

You get over 3 times greater discharge capacity and thermal endurance—plenty of "guts" for withstanding high lightning currents, multiple lightning strokes, long-duration lightning discharges and severe switching surges.

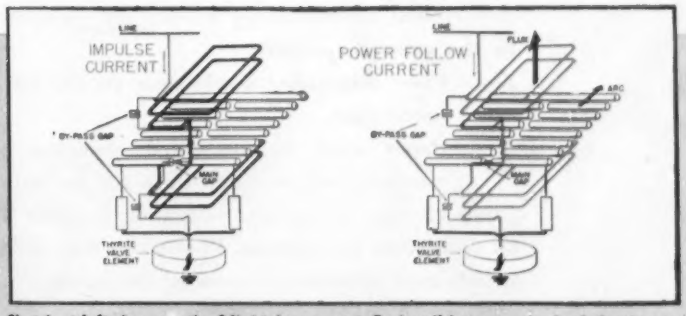
You get greater endurance now—and it protects you for future increasing discharge duty on station arresters attending trends to higher voltage lines, longer lines, greater lengths of cables, and more shunt capacitors, which increase the stored $CE^2$ energy in switching surges.

For more information about this new station arrester, get in touch with your nearest G-E Apparatus Sales Office or write for Bulletin GEA-1304 to Section 432-5, General Electric Company, Schenectady 5, N. Y.

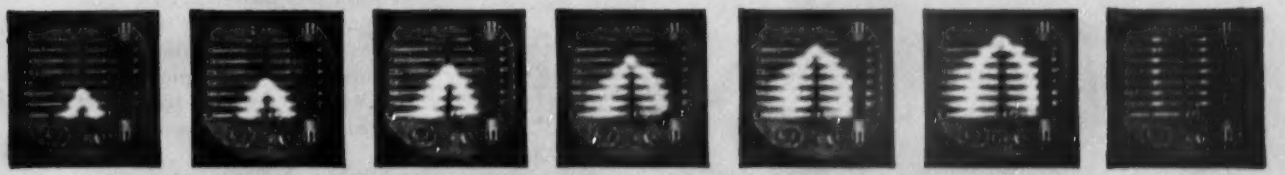
## GENERAL ELECTRIC



**Cut-away view of new arrester showing new gap units and their components. Gap unit (circled in red) consists of 7 pairs of adjacent gap electrodes within the field of 2 magnetic coils. One pair of electrodes constitutes main gap which controls impulse sparkover sensitivity; other pairs of electrodes form multigap path for arc-interruption of the power follow-current.**




**Sketch at left shows path of lightning current. Each coil has a pre-ionized shunt gap that by-passes lightning current to the discharge path shown in red. Sketch at right shows path of 60-cycle power follow-current. After lightning sparkover, the 60-cycle power follow-current flows through the coils, as shown in red, creating magnetic flux. Arrows indicate direction of magnetic flux and blowout motion of arc, which motion is the same for either polarity of the 60-cycle follow-current wave.**



**Film strip (from high-speed movies) shows how magnetic force sweeps power follow-current arc progressively from main gap (see extreme left) to as many as 14 multigaps in series (see second from extreme right) for efficient arc-interruption in less than a half cycle. The arc-path moves so rapidly that even hundreds of interrupting operations cause no harmful scarring or burning of gap electrodes.**

# Extension Planners Speed Up Customer Service in San Diego

From its radically different approach to the handling of customers' extensions, San Diego Gas & Electric Co expects improved efficiency and better public relations. Its new extension planning department which began operations June 1, cuts across several conventional departmental lines to concentrate most of the departmental functions in a single outside man. This man handles contracts, obtains right-of-way, sells, collects money, and plans and supervises the installation of service. He also takes on any incidental jobs arising on the spot.

Preliminary studies of the new method show that the company can reasonably expect to cut from an average 70 to an average 12 days the time for processing applications for electric service and delivering them to the construction department. Under the former method, the time could vary anywhere from 20 to 140 days.

**Growth Forces Change . . .** "Our system worked fine when San Diego County was a size in which everyone shook hands with everyone else. But we simply have to have more flexibility," said Pres E. D. Sherwin in explaining how the problem of shortening the processing time arose from the phenomenal growth of the company's territory.

Sherwin cited these figures: In 1940 the company had 101,628 customers; in 1946 there were 140,991; and by 1952, 210,624. And still the number increases. In that period the average annual consumption per customer jumped from 2,900 to 6,100 kwhr, and generating capacity went from 100,000 to 354,000 kw.

**Cost Reduction Incidental . . .** "Cost reduction was not an item in the decision to create the department; but as it turned out, the improved efficiency will effect a cost reduction," said Fred E. Edwards, superintendent

## Steps in Handling Customer's Extensions

1. **Application for service is received and passed on to planner.**
2. **Planner contacts the customer, obtains a deposit, ascertains meter location, completes right-of-way negotiations if necessary, and obtains customer's signature on necessary forms.**
3. **Planner makes sketch of job and stakes pole location.**
4. **Planner returns to office at end of day, writes order for construction crew, makes out warehouse material charge slip.**
5. **Copies of sketch are sent to transportation department, giving time of delivery; to the storeroom to have material ready; to the right-of-way department for obtaining needed city permits; and to the crew dispatcher.**
6. **Crew dispatcher sends crew to site on designated date.**
7. **Paper work is completed charging proper accounts and crediting back for tax valuation, funds charged to various valuation districts. This is all done after installation. Previously this took place in advance delaying processing the application for service.**

# Blast the Arc

## with DELTA-STAR'S New "JT-1" Gas Blast Interrupting Device

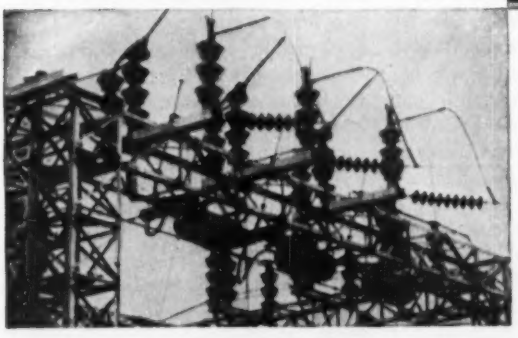
Delta-Star's new "JT-1" interrupting device for use with standard air switches is now ready for installation on your transmission systems. Extensive laboratory and field tests including many actual installations have proved the "JT-1" to be the ideal device for use on transmission lines from 69 to 161 kv where circumstances do not require the interrupting capacity or justify the use of a circuit breaker. With the "JT-1" installed on your air switches light loads can be interrupted without danger of long arcs causing phase-to-phase faults.

The "JT-1" is a gas blast device utilizing compressed nitrogen or air to "blow out" the arc at the contacts of a switch immediately after the arc has formed. The gas blast is controlled by a cam operated valve mechanism under each switch unit which is in turn operated directly by the switch operating mechanism. These valves open automatically when the switch blade reaches a predetermined position.

Since arc extinction does not depend on gas expulsion by disintegration of an arc chamber an unlimited number of operations are possible without replacement of parts.

The next time you have a problem where switches must be operated under load or long lines dropped, investigate the possibility of using Delta-Star "JT-1" interrupters. For full particulars write the factory or nearest district representative.

▲ "JT-1" Interrupter mounted on 115 kv "MK-40" disconnect.



◀ Installation of "JT-1" Interrupters on 115 kv "MK-40" 3-pole group operated switches. Photo shows blade position immediately after arc was extinguished.

**WHEN YOU WANT THE BEST IN HIGH VOLTAGE SWITCHING EQUIPMENT SPECIFY DELTA-STAR**

# DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
OF PITTSBURGH
2437 FULTON STREET, CHICAGO 12, ILLINOIS
DISTRICT OFFICES IN PRINCIPAL CITIES

# Efficiency Rules, but the Personal Touch Is Kept

of the old customer extensions department until his appointment as director of the new department. He is assisted by Edwin C. Fremo, formerly a statistical operating engineer.

The selection of supervisory personnel gives a key to the operation of the new set up. Edwards came up through the commercial end of the business, Fremo through engineering. The new department reports to Hugh Stewart, executive engineer.

"We knew we needed a program which would cut across several existing departmental lines," Sherwin said, "and it was felt that to work it out within our own organization would be almost impossible."

Hence, Booz, Allen & Hamilton, management consultants, conducted the preliminary studies for a new department in which the emphasis would be on public relations and efficiency. The company expects to maintain the excellent public relations it has enjoyed but which were threatened by the slowness of processing orders.

**New and Old Methods Compared . . .** The new elapsed time of 12 days for processing jobs is believed to be a workable minimum. Some backlog is necessary for economic operation, and a customer can rarely take service any faster. Under the new program orders are in the construction department awaiting completion of the customer's project, geared to his timetable, not the company's. Costly rush jobs are held to a minimum.

Under the old system, many sections of the company were involved in the paper work on a new order before it hit the construction department. Right-of-way, engineering, accounting, sales—these are just a few of them.

The new integrated plan involves one outside man who performs the function of these departments. He maintains contact with the customer, and the customer always knows whom to contact. This alone is expected to eliminate much customer ill will occasioned by checking from department to department to determine progress on the order.

**How New Program Works . . .** Here's the way the new program works:

An application signed by a prospective customer is given to a planner who makes field contact with the customer, lays out the work, gets a contract if needed, collects a deposit, and conducts any negotiations necessary to laying out the line.

The planner then takes a simplified easement form (a non-recorded grant) for facilities on private property. This eliminates a search of titles. Under the old system 30% of all jobs had to go to the land division for title search. The new system eliminates two-thirds of this flow through survey.

The simplified easement form involves the company's taking a calculated risk. But it was felt that it is more expedient to be faced with minor pole relocation or adjustment in the interest of the overall time and effort saved. Actually, the adjustments are expected to be so few that the cost will be insignificant. A similar simplified easement form in use elsewhere has been upheld by the courts as legal and valid.

**Sales Work . . .** The planner also sells. When the customer has made arrangements for connecting a pump, the planner may sell him on the idea of using a range or other appliance, to insure the customer's using the energy specified in his contract.

Then the planner makes a sketch of the job and writes a construction order and materials list. These documents, when all is in order, he simply forwards to the construction department. Management has foregone giving approval on 90% of the jobs, those of minor cost. Previously, all jobs had to go to the vice president for signature. Now management takes the position that inasmuch as it is required to serve the customer by public utility commission regulation, there is no need for such minute attention. It is concerned only with the relatively high cost jobs which constitute about 10% of the total.

The planner is trained to exercise judgment in releasing an order to construction. He must make sure that the customer is ready. Until he is sure, he, not the construction department, holds the order. When construction gets the order, it is ready to go. Thus construction has a workable backlog of ready-to-go orders, and hedge-hopping on rush jobs is eliminated.

Lastly, the planner coordinates setting of the meter with completion of the line and sees that the contractual obligations have been fulfilled. New orders which can be served from existing lines require only that the planner establish the service and meter locations in the field. This makes combining jobs possible. The planner can pick up business on pending orders while in the area, thus eliminating returning next week to a job next door.

**Personal Touch . . .** Each of approximately 25 planners is assigned a specific area. He can feel the pulse of the people and investigate anything pertinent to the system.

Under the old setup a termited pole replacement on a new business job was the function of two departments. The new plan combines such maintenance and new business work, particularly where a customer contact is involved. Thus, the planner may go out on a minor maintenance problem and end up selling the new customer on installing a range. Formerly, maintenance was the function of the engineering department which is not closely related to customer contact work.

When the planner stakes the location of a pole, time and paper work are saved. The survey crew is reserved for the big jobs. The sketch also shows the pole locations so that if a stake is misplaced or moved, the construction foreman can recheck. Under the old plan, he called the survey crew, and his own crew of as many as 16 men merely sat around waiting for the staking crew.

The number of field men remains about the same under the new program. The difference lies in their increased duties and responsibilities and the overall decrease in time spent. Excess personnel in the several departments affected are being absorbed into other departments.

The new system is expected to pay increased dividends in efficiency, reduced costs, and improved public relations for many years. At present there is no indication that the growth of the San Diego area will slow down. Even if it should stop entirely, there are always service changes to be made; so the system should continue to prove beneficial.

**But why should you care?**

You should care because that whistle summons thousands of B&W men who are vital to the country's biggest job.

That job is producing more and more low-cost power with ever greater efficiency.

B&W's contribution consists of building boilers that convert the inert, raw energy found in primary fuels like coal, oil, and gas, to high level, useable energy — steam. Steam is your greatest single source of power, and only a boiler can make it.

A complex, modern boiler is the composite result of unending research, imaginative engineering, highly skilled fabrication, and meticulous erection . . . minds, hands, and machines. Our whistle symbolizes all of these; the brainpower as well as the vast physical plant and facilities that are B&W. In nine modern plants containing some of the largest and most powerful equipment of its type, B&W craftsmen utilize skills born of unparalleled experience to transform the accomplishments of research and engineering into some of the most efficient boilers in the world.

B&W's physical growth has matched the huge growth of its job. But even more important is the vast store of knowledge and experience accumulated throughout almost 90 years of manufacturing steam generators. Experience such as this, applied to the problems of steam technology, is quickening the pace of universal progress.

BABCOCK & WILCOX

BOILER DIVISION

N-184

## LILCo President Gets Project Under Way

Long Island Lighting Co Pres Errol W. Doebler got construction under way for the company's new $2.7-million administration building at its central operating headquarters in Hicksville by turning over the first spade-full of earth July 7. Pictured with him are A. Holly Patterson (left) Nassau County executive and Lewis Waters, supervisor of the town of Oyster Bay.

The administration building will provide modern office facilities for about 800 employees now located in scattered buildings in Mineola and Garden City.

## Uranium Producers Ask Colorado A-Power Plant

Shortage of electric power and lack of transmission lines "is one of the most acute problems facing the uranium-producing industry in the Colorado Plateau area," a spokesman for the producers has declared.

Stephen L. R. McNichols, attorney for the Ore Producers Association, made the statement in an appeal to Sen Edwin C. Johnson (D-Colo.) for aid in bringing an atomic energy plant to southwestern Colorado to generate electricity. McNichols said there are some 600 "power-hungry" uranium mines in the area.

Johnson is a member of the joint House-Senate Committee on Atomic Energy.

The uranium producers' appeal was in support of a similar plea from the Colorado State Association of REA Cooperatives (EW, July 26, p 158).

McNichols said an AEC-REA atomic power plant in southwestern Colorado would serve efficiently most of the 600 producing uranium mines in the Four Corners country of Colorado, Utah, Arizona, and New Mexico.

"Power is needed desperately by many of our producers," McNichols said. He claimed an AEC-REA power plant would save taxpayers millions annually by cutting the cost of uranium production an estimated 10%.

## POWER BRIEFS

● Georgia Power Co last month added its 10,000th new user during 1954. Total number of customers now being served by the utility is 540,665.

● A new 115-kv electric substation has been energized at Jersey Central Power & Light Co's Raritan River generating station, Sayreville. Completion of the substation represents another step in the company's program for increasing its electric transmission system from 69 to 115 kv.

● Gulf States Utilities Co has purchased a 159-acre tract on the Sabine-Neches ship canal east of Port Arthur for a future power plant. The utility paid $215,000 for the property.

● A Federal Power Commission license for the Toketee project held by California-Oregon Power Co has been amended to include two additional hydro projects with an installed capacity of 62,000 kw.

● Bonneville Power Administration has taken over operation of the 20-mile Lookout Point-Oakridge 115-kv transmission line built by Lane County (Ore.) Electric Cooperative, Inc. Final settlement on purchase price is to be negotiated under the purchase option deal Lane made with BPA prior to the co-op's construction of the $400,000 line last year. The line was energized simultaneously with BPA's new 6,000-kva substation to supply the co-op's segregated Oakridge system.

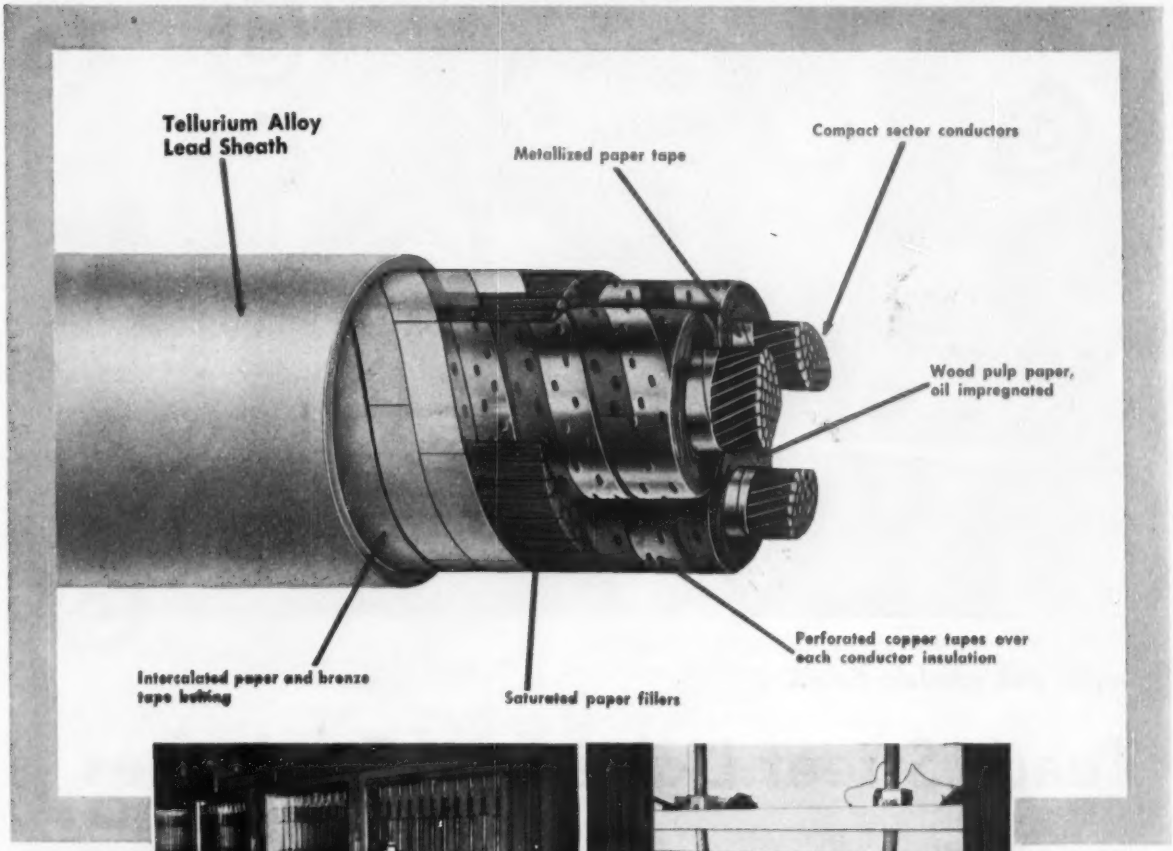
● Alabama Electric Cooperative, Inc, Andalusia, has been granted a $2,973,000 loan by Rural Electrification Administration to finance system improvements. The co-op plans to build 57 miles of 46-kv transmission line, 45 miles of 115-kv transmission line, and related substation facilities.

● A Golden Jubilee Celebration will be held on the University of Illinois campus at Urbana Oct. 15-16 to mark the 50th anniversary of the founding of Eta Kappa Nu Association, electrical engineering honor society.

● Potomac Electric Power Co placed in operation July 14 the largest generating unit in its system. The 90,000-kw unit is installed in the company's Potomac River Station, Alexandria, Va.

● Southern Nevada Power Co is planning to build a 44,000-kw steam plant at Whitney, Nev.

# FOR INCREASED LOAD REQUIREMENTS...PAPER INSULATED CABLE WITH TELLURIUM ALLOY LEAD SHEATH


Tellurium Alloy Lead Sheath
Metallized paper tape
Compact sector conductors
Wood pulp paper, oil impregnated
Perforated copper tapes over each conductor insulation
Interscalated paper and bronze tape bedding
Saturated paper fillers

**Some of the specially-developed testing equipment with which Roebling maintains quality control of the production of Tellurium Alloy Lead Sheath. #1 Temperature control ovens for creep test of strips cut from tellurium alloy lead cable sheathing.. #2 Temperature control oven for bending fatigue test of full cable section.**

YOU'LL REALLY solve power cable headaches with Roebling Paper Insulated Cable with the new Tellurium Alloy Lead Sheath*, a Roebling exclusive. Here are some of its outstanding advantages:

1–Tellurium Alloy Lead Sheathed Cable has a lower long-time creep rate;
2–Extra high fatigue resistance;
3–High bursting strength;
4–Exceptional stability under heat application as in duct splicing and wiping;
5–Abolishes need for frequent stop joints or reinforced lead sheath;
6–Doesn't require generous expansion bends or large manholes;
7–Heat application in splicing leaves its desirable properties unimpaired.

**WRITE US FOR FULL DATA.** John A. Roebling's Sons Corporation, Dept. 707, Trenton 2, N. J.

**ROEBLING** CF&I

*SUBSIDIARY OF THE COLORADO FUEL AND IRON CORPORATION*

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HGTS. BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 4216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, ROOM 239, HENRY W. OLIVER BLDG. • ROCHESTER, 1 FLINT ST. • ST. LOUIS, 3001 DELMAR BLVD. • SALT LAKE CITY, 536 W. 8TH SOUTH STREET • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Dayton P&L schedules classes to . . .

# Teach Street Lighting to Employees

Fundamentals of street lighting are being taught at a new night school class for employees of Dayton Power & Light Co. The class is the outgrowth of other employee training activities. Employees themselves requested the street lighting course and 13 are enrolled. They are engineering and operating personnel.

The course was developed and is taught by H. S. Nonneman, the Company's municipal representative. It is a comprehensive course with two hours a week of classroom work for 20 weeks. This gives a good background of street lighting fundamentals. Lighting manufacturers have supplied several guest lecturers.

To date 12 lectures have been given. Examinations are held each week on the previous lecture. Subjects for the course are listed below.

The course is financed largely by the public school system as part of their system of adult education. It is open only to employees. Consideration is being given to offering the course to selected groups of service, safety and street lighting personnel of the municipalities.

## Subjects Scheduled for Street Lighting Course

1. Oct. 15 — Physics of light.
2. Oct. 22 — Light and color.
3. Oct. 29 — Physiological Effects of Radiation & Color.
4. Nov. 5 — The Illuminating Engineer's Measurements.
5. Nov. 12 — Principles of Light Control.
6. Nov. 19 — Photometry.
7. Dec. 3 — Light sources.
8. Dec. 10 — Historical background of street lighting.
9. Dec. 17 — Fixtures and application.
10. Jan. 7 — Distribution curves and their uses.
11. Jan. 14 — Refractor glassware.
12. Jan. 21 — Street lighting poles & mountings. Theory and Principals of Street & Highway Lighting.
13. Jan. 28 — American standard practice.
14. Feb. 4 — American standard practice.
15. Feb. 11 — American standard practice.
16. Feb. 18 — Street lighting problems.
17. Feb. 25 — Engineering and controls.
18. Mar. 4 — Promotional data regarding street lighting.
19. Mar. 11 — Street lighting problems.
20. Mar. 18 — Method of providing funds and other street lighting economics.

POWERS American

**Series 450 CONSTRUCTION AND OVERHEAD MAINTENANCE BODY**

# Does the Work of TWO TRUCKS

Ladder can be revolved 360° at elevations from 30° to 75°. In 23'6", 26'6", and 30'6" mechanical units, or 35' hydraulic model.

Body is 108" long, for installation on dual-rear wheel chassis having cab-to-axle dimension of approximately 60"

Here's a multi-purpose body that does work normally requiring two or more specially-equipped vehicles.

FOR OVERHEAD WORK . . . the body has a Powers-American mechanical or hydraulic Aerial Ladder, in a working height best suited to individual needs.

FOR SERVICE WORK . . . compartments provide space for the orderly storage of a wide assortment of tools and parts.

FOR CONSTRUCTION WORK . . . simplified, easy-to-use derrick handles poles up to 35 ft. in length. A 10,000 lb. underslung winch pays out cable beneath the body floor. A universal swivel sheave permits winch line pull in any direction, without limitation.

COMPLETE DESCRIPTION is given in Bulletin No. 118. A copy, with quotation, is yours for the asking.

Derrick utilizes flexible steel cable instead of conventional center leg. Stows in loading area rack when not in use.

**POWERS-AMERICAN DIVISION**
**McCABE-POWERS AUTO BODY COMPANY**
5900 No. Broadway • St. Louis 15, Missouri
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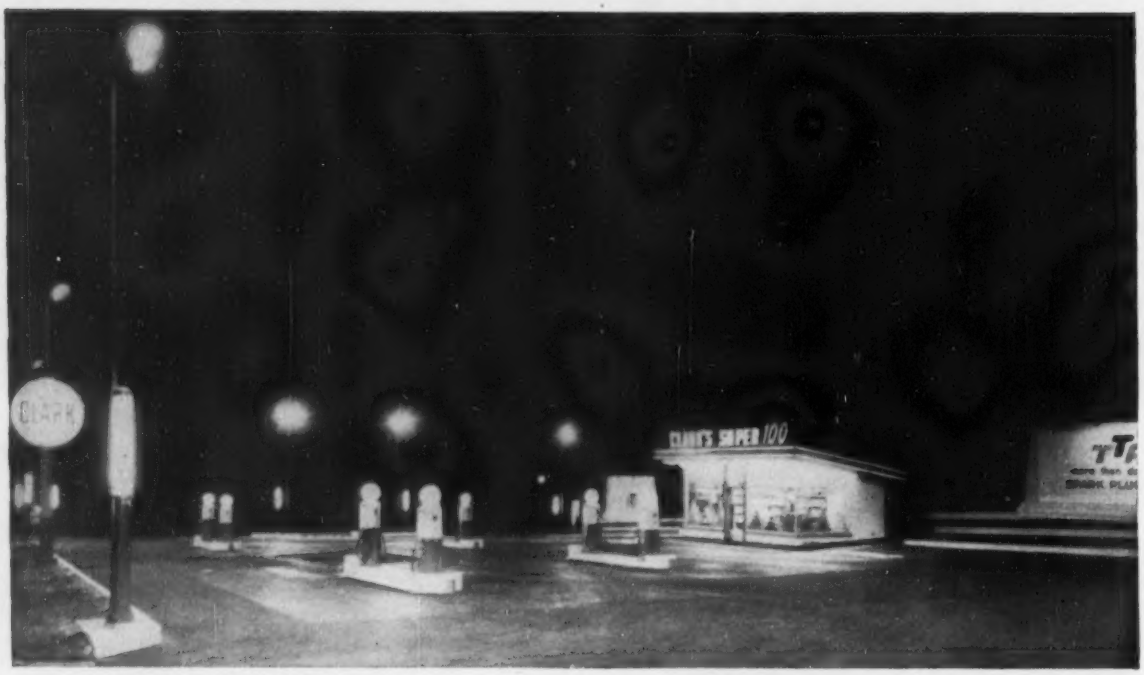



ALL-ELECTRIC SERVICE STATION load includes 16.3 kw in lighting; 16 kw in space heating and 4 kw in miscellaneous motors, etc. for a total connected of 36.3 kw. Plans call for making all stations in the chain all-electric

# Service Station Promotion Builds Load

Aggressive promotion of automobile service station loads was a part of the program which won for Union Electric Co one of the Edison Electric Institute Planned Lighting Awards. Although lighting is featured in the service station activity, it is only one of several types of loads that are promoted.

While complete results data have not been tabulated, all indications are that the program has been extremely successful in developing load for the Union Electric Co and business for others associated in the work. Two electric equipment suppliers have reported a marked increase in sales as a result of the Union Electric Company's program.

**Get Results . . .** An example of some of the results obtained is the installation at the Clark Super 100 Gas Service Station. This is an all-electric station. Load installed is as follows:

| | |
|---|---|
| Lighting | 16.3 kw |
| Space heating | 16.0 kw |
| Miscellaneous, motors, etc. | 4.0 kw |
| Total load | 36.3 kw |

## Types of Loads Recommended

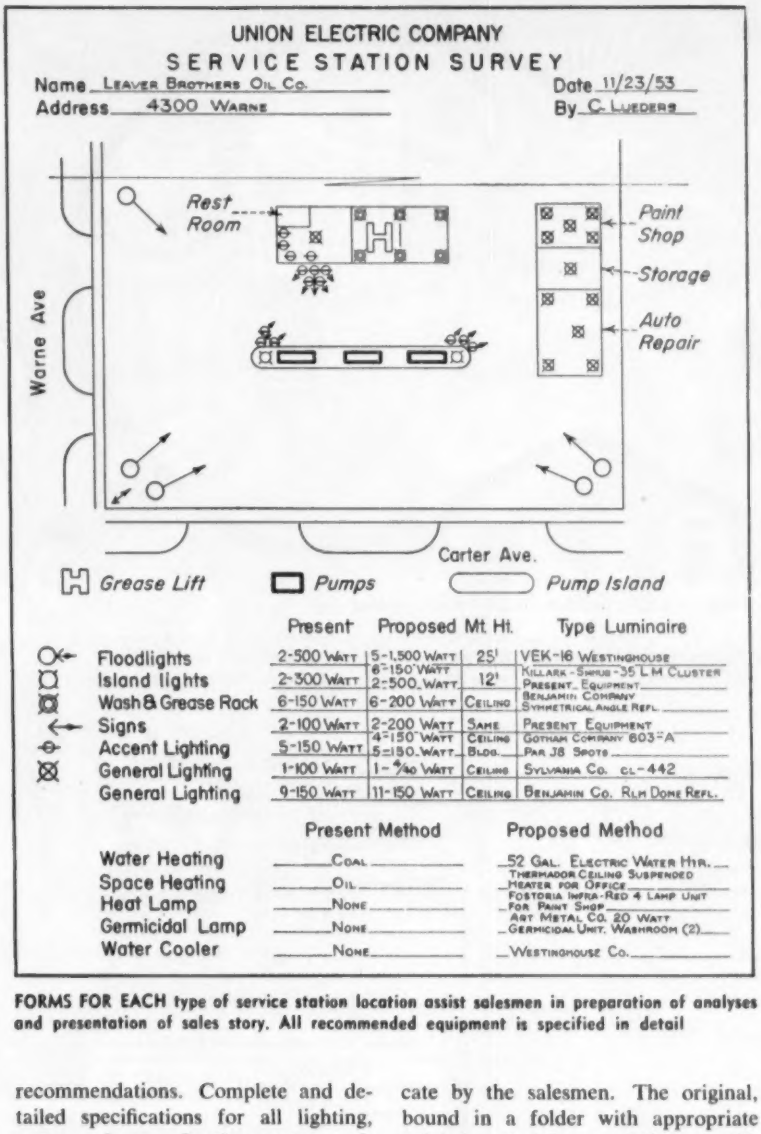
| | | Average per Station |
|---|---|---|
| Lighting | 2,781.25 kw | 3.58 kw |
| Water heating | 1,036.40 kw | 1.34 kw |
| Space heating | 814.95 kw | 1.05 kw |
| Heat lamps | 109.86 kw | .14 kw |
| Germicidal lamps | 55.66 kw | .07 kw |
| Total Recommended Load | 4,798.12 kw | 6.18 kw |

Since this service station was completed late last fall, the Clark chain has converted another station to all-electric status. Their program calls for all-electric stations throughout their chain.

Plans call for a complete survey of each of the 1,467 service stations in the area and preparation of a complete analysis of the operation of each. This analysis is presented to the operator of the service station or the manager or chain which operates it, along with recommendations for lighting or other electrical equipment that will improve the operation or increase the profits.

Already 776 of the total of 1,467 stations have been surveyed and a total of 4,798.12 kw of load have been recommended. Types of loads and amounts of each type recommended are shown in the table. The recommended load increase has averaged 6.19 kw per station.

Stations have been divided into three types: corner locations; in the block locations; and irregular locations. Forms available for each type facilitate preparation of analyses and



UNION ELECTRIC COMPANY

SERVICE STATION SURVEY

Name Leaver Brothers Oil Co. Date 11/23/53

Address 4300 Warne By C. Lueders



| | Present | Proposed | Mt. Ht. | Type Luminaire |
|---|---|---|---|---|
| Floodlights | 2-500 Watt | 5-1,500 Watt | 25' | VEK-16 Westinghouse |
| Island lights | 2-300 Watt | 6-150 Watt 2-500 Watt | 12' | Killark-Shrub-35 L.M Cluster Present Equipment |
| Wash & Grease Rack | 6-150 Watt | 6-200 Watt | Ceiling | Benjamin Company Symmetrical Angle Refl. |
| Signs | 2-100 Watt | 2-200 Watt | Same | Present Equipment |
| Accent Lighting | 5-150 Watt | 4-150 Watt 5-150 Watt | Ceiling Bldg. | Gotham Company 603-A Par 38 Spots |
| General Lighting | 1-100 Watt | 1-¾0 Watt | Ceiling | Sylvania Co. CL-442 |
| General Lighting | 9-150 Watt | 11-150 Watt | Ceiling | Benjamin Co. RLM Done Refl. |

| | Present Method | Proposed Method |
|---|---|---|
| Water Heating | Coal | 52 Gal. Electric Water Htr. |
| Space Heating | Oil | Thermador Ceiling Suspended Heater for Office |
| Heat Lamp | None | Fostoria Infra-Red 4 Lamp Unit for Paint Shop |
| Germicidal Lamp | None | Art Metal Co. 20 Watt Germicidal Unit. Washroom (2) |
| Water Cooler | None | Westinghouse Co. |

**FORMS FOR EACH type of service station location assist salesmen in preparation of analyses and presentation of sales story. All recommended equipment is specified in detail**

recommendations. Complete and detailed specifications for all lighting, water and space heating, water coolers, etc. equipment are furnished on the forms including present and proposed lamp wattages and luminaire mounting heights.

When the program was launched last fall each commercial sales representative was provided at the sales training meeting with a manual having four sections: lighting, space heating, water heating, and merchandising ideas. Each section contained numerous application ideas and methods of sales presentation, rules-of-thumb for sizing recommended equipment, lists of equipment dealers in the area and other helpful information.

For the lighting portion of the campaign, two direct mailing pieces were sent to all service stations.

All layouts were prepared in duplicate by the salesmen. The original, bound in a folder with appropriate printed material, was delivered with a sales presentation to the customer. The duplicate was retained in the office file for salesman's follow-up.

## Home Freezing Booklets

Three new booklets on home freezing—containing the most recently developed recipes and methods for freezing fruits, vegetables, meats of all kinds, and ready-cooked foods—have just been made available to the public by the Westinghouse Electric Appliance Division.

Edited by Mrs. Julia Kiene, director of the Westinghouse Home Economics Institute, the three "Home Freezing Guides" have been developed over a period of five years. Through its research and testing during this period of time, the Institute has discovered many new ways for freezing foods.

"How to Freeze Fruits and Vegetables" covers the subject of: how to pick fruits and vegetables for freezing, preparation of these foods for freezing, and how these foods should be thawed or cooked when removed from the freezer for serving.

"How to Freeze Meat and Game, Poultry, Fish and Dairy Products" points out the care which must be taken in wrapping meat for freezing, how to select and prepare the meat for freezing, and the length of time the various meats, fish and dairy products may be safely kept frozen.

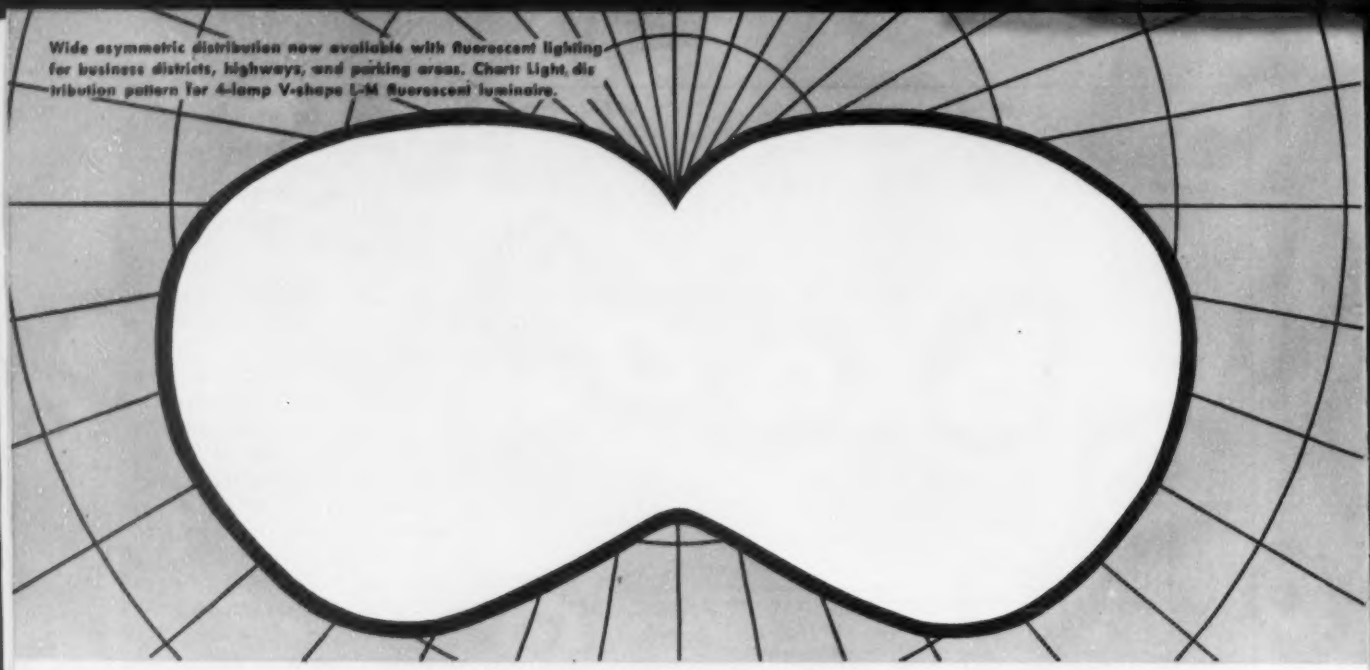
"How to Freeze Ready-Cooked Foods" covers proper freezing techniques for breads, sandwiches, cakes and cookies, pies and pastries and other desserts. Each of the three 16-page guides may be obtained for five cents each from Consumer Service, Department FG, Westinghouse Electric Appliance Division, Mansfield, Ohio.

## Range Program Coordinated Nationally

To give additional customer impact to local campaigns, this fall's "Special Jubilee Showing" of electric ranges will again be coordinated nationally.

H. H. Brenan, new chairman of Edison Electric Institute's Residential Section, announced that the September-October-November campaign is being set up on an industry-wide basis by the residential promotion committee. Indications are that participating investor-owned electric utilities will top the record participation in the spring campaign. The promotion will also be widely backed by manufacturers, dealers and distributors.

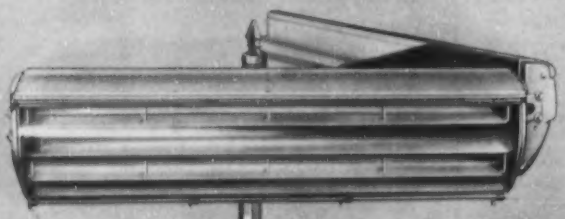
Formally called the Fall 1954 Coordinated Electric Cooking Jubilee, the "Plan for Action" outlines the need for wide display and media advertising, and for intensive use of booklets and folders. "Be Modern . . . Cook Electrically" will again be the industry slogan. It is suggested that campaigns begin in September and end in October. The final month is left open for closing with prospects developed. This plan permits a building to the high-light day of Light's Diamond Jubilee, October 24.



Wide asymmetric distribution now available with fluorescent lighting for business districts, highways, and parking areas. Chart: Light distribution pattern for 4-lamp V-shape L-M fluorescent luminaire.

## L-M Fluorescent Luminaire Installation Data

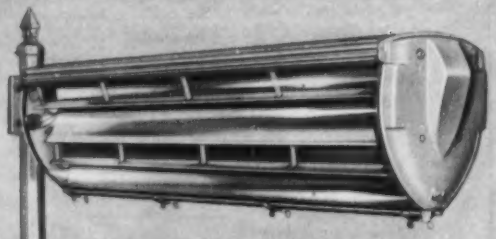
**Average foot candles at 50° F. temp. in still air—25′ mounting height. Illustrations below show L-M's various types of units and mountings, together with the average foot candles on the street with various spacings.**



4-lamp V-shape fluorescent luminaire provides more even light distribution for wide streets.

**4-Lamp V-shape Fluorescent Luminaire***

| Spacing | Staggered 50′ Street Width | Opposite 70′ Street Width |
|---|---|---|
| 75 ft. | 1.75 A.F.C. | — |
| 100 | 1.30 | 2.15 A.F.C. |
| 125 | 1.05 | 1.90 |
| 150 | 0.85 | 1.45 |
| 175 | — | 1.25 |



4-lamp bi-directional fluorescent luminaire provides a broader light pattern for center parkway and area lighting.

**4-Lamp Horizontal-mounted Fluorescent Luminaire***

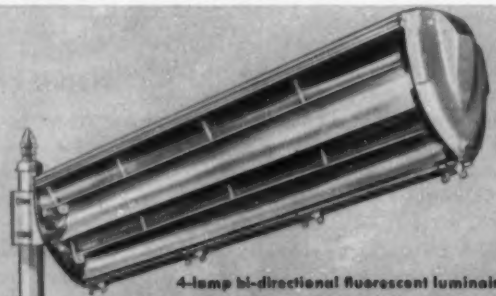
| Spacing | Center-Mounted Twin Arm 40′ Road Twin Roadways | Staggered 50′ Street Width | Opposite 70′ Street Width |
|---|---|---|---|
| 75 ft. | 2.85 A.F.C. | 1.35 A.F.C. | — |
| 100 | 2.15 | 1.00 | 1.55 A.F.C. |
| 125 | 1.70 | 0.80 | 1.26 |
| 150 | 1.40 | 0.65 | 1.05 |
| 175 | 1.20 | — | 0.90 |

3-lamp uni-directional fluorescent luminaire is available for underpasses, floodlighting, perimeter, and ramp lighting.

**2-Lamp Uni-directional Fluorescent Luminaire***

Readings were made of ramp installation consisting of ten 2-lamp uni-directional fluorescent luminaires. 22′ mounting height—spaced 8′ on center.

| Dist. From Source | Vertical F.C. | Horizontal F.C. |
|---|---|---|
| 50 ft. | 9.70 | 6.50 |
| 100 | 2.40 | 1.20 |
| 150 | 1.10 | 0.35 |
| 200 | 0.65 | 0.05 |
| 250 | 0.40 | — |
| 300 | 0.25 | — |
| 350 | 0.20 | — |

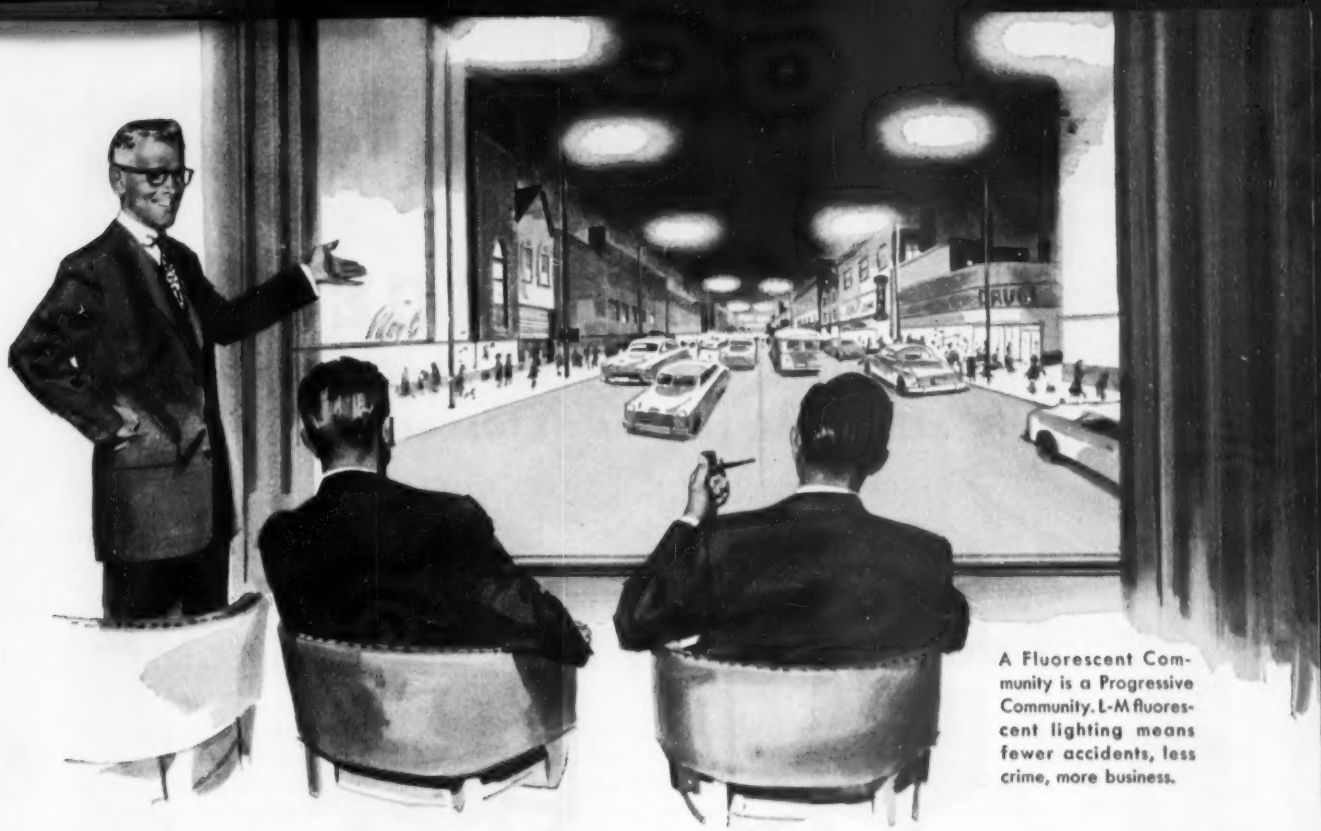


4-lamp bi-directional fluorescent luminaire with 20 degree tilt is designed for the narrow street and entrance way.

**4-Lamp Tilted Fluorescent Luminaire (20° Tilt)***

| Spacing | Staggered 40′ Street Width | Staggered 50′ Street Width | Opposite 70′ Street Width |
|---|---|---|---|
| 75 ft. | 1.50 A.F.C. | 1.35 A.F.C. | — |
| 100 | 1.15 | 1.05 | 1.60 A.F.C. |
| 125 | 0.90 | 0.80 | 1.30 |
| 150 | 0.75 | 0.65 | 1.10 |
| 175 | — | — | 0.90 |

*From test reports E353-83, E353-817, E353-810, E353-88.



A Fluorescent Community is a Progressive Community. L-M fluorescent lighting means fewer accidents, less crime, more business.

# L-M's New Fluorescent Street Lighting Luminaire
# Large Light Source, Minimum Glare

By **STACY STANDLEY**
Manager
Lighting Sales
Line Material Company

L-M's New Fluorescent Luminaire is a revolutionary improvement in street lighting. With its large light source the fluorescent luminaire produces an even, cool white color over a large area. Because of its large light source, it provides virtually glareless illumination.

Fluorescent luminaires provide a light that is particularly advantageous in business and shopping sections. The surrounding sidewalk area adjacent to the curb is illuminated and gradually fades out to make the background contrast as gradual as possible. This provides a wider scope of vision for both the motorist and the pedestrian, in addition to creating a cheerful and active atmosphere in the shopping area.

L-M's New Fluorescent Luminaires are available in these styles:

**1** 4-lamp V-shape for use on wide streets

**2** 4-lamp bi-directional tilted 20° toward the street for narrower streets and entrance ways

**3** 4-lamp bi-directional with level horizontal mounting for center parkway and area lighting

**4** 2-lamp uni-directional for underpass, flood lighting, perimeter and ramp lighting

The fluorescent lamp used in these luminaires has a rated lamp life of 7500 hours. This longer lamp life reduces the cost of relamping luminaires below any other type now used for street lighting.

### Features of L-M's New Fluorescent Luminaires

**Large light source • Even, cool white color • Minimum glare • Low power consumption • Longer lamp life**

**Separate efficient reflecting system for each lamp • Good vertical component across the whole surface of the street • Good balance between building and road surface**

**Two lamp ballasts • Easy accessibility for relamping • Wiring terminal block easily accessible • Ballast can be removed very simply • Bracket adjustable ±5° for leveling.**

L-M's fluorescent luminaires are easily accessible for cleaning, relamping, wiring terminal block and ballast removal. Four-lamp unit has two ballasts with one tube on either side of the luminaire paired to each ballast. Thus, if one tube burns out, the light output of the luminaire is reduced only 50% in each direction. Also, if desired, two lamps could be switched off for part night circuits.

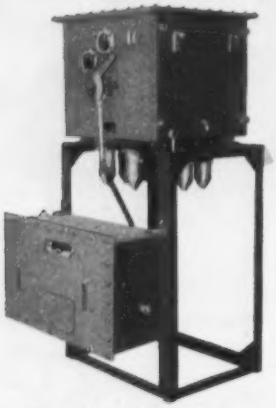
### Get Complete Information

Details of the new L-M fluorescent luminaires are available. Ask the L-M Field Engineer for information, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

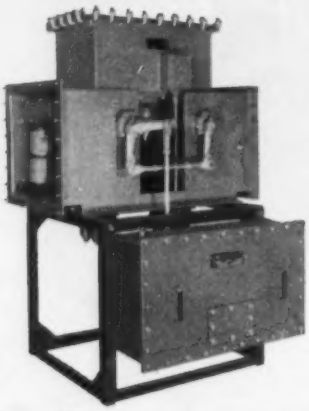
**LINE MATERIAL** Street Lighting

# AVOID OUTAGES

## by transferring important loads to an alternate feeder automatically



Type "RAD" double throw oil switch unit with Model "F" automatic mechanism.



Type "DRA" two single throw oil switch unit with Model "F" automatic mechanism.

- **When preferred feeder voltage fails, the load is automatically transferred to the emergency feeder.**
- **When preferred feeder voltage is restored (for a period of ¾ minute) the load is automatically returned to the preferred feeder.**
- **There is no "hunting" on system disturbances. Load cannot be thrown to a "dead" source.**
- **Model "F6" automatic mechanism provides for remote operator selection of either feeder as the "preferred."**

The automatic mechanisms are applied to various forms of Type "RA" oil switches, either for underground cables or overhead connections—up to 23 Kv., 400 amperes. All control wiring is done at the factory. Installation of the unit merely involves connection of the feed and load cables or wires.

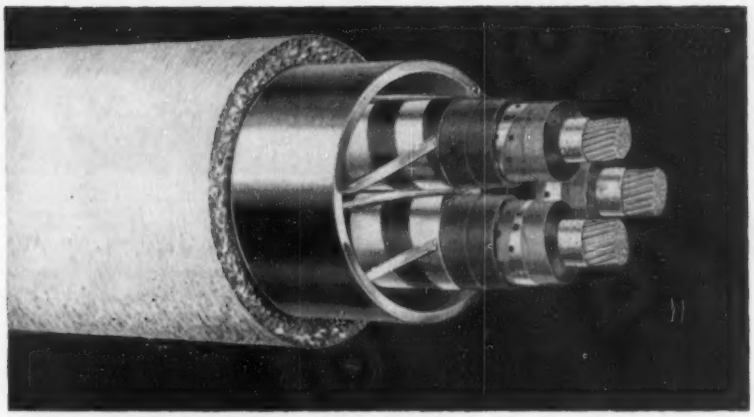
Send cable data and description of installation conditions for quotation on automatic transfer oil switches to meet your requirements.

**G & W ELECTRIC SPECIALTY CO.**
**7780 Dante Avenue, Chicago 19, Illinois**

Representatives in principal cities of U.S.A.
In Canada: Powerlite Devices, Ltd., Toronto, Montreal & Vancouver

G&W

D-545



# Phelps Dodge Ships 1st 230-Kv Cable for U.S.

The first 230-kv, pipe-type, oil-compression cable for installation in the United States has been shipped by Phelps Dodge Copper Products Corp. Nine reels, approximately 9,600 ft of single conductor cable, will be installed at Garrison Dam, Riverdale, N. D. Garrison, the largest earth-filled dam in the United States, is being erected by the Army Engineers on the Missouri River.

The installation will consist of three circuits run in a tunnel from the transformers to the switchyard, approximately 1,000 ft. The cables, made at Phelps Dodge's Habirshaw Plant, are of the polyethylene, sheathed, oil-compression type. Three cables will be placed in an 8⅝-in. OD steel pipe filled with oil at a pressure of 200 psi.

Phelps Dodge has conducted a continuous program of research on cable for 230 kv and higher and over a number of years has collaborated with the G&W Electric Specialties Co in their development of potheads for extra high-voltage service. Several full-scale factory runs of experimental cable, oil filled as well as pipe type, have been evaluated. In connection with this program a prototype length of 230-kv, high-pressure, pipe-type cable was supplied to the Bonneville Power Administration for tests in 1952.

The Garrison Dam cable is single conductor, 500 Mcm, 0.835 in. paper insulated, shielded, has permanent extruded polyethylene sheath, reinforcing bronze tape, and D-shaped brass skid wires. The conductor is oval compact bare copper. Two 3-mil metallized paper tapes over the conductor provide a smooth conducting service. The 835 mils of impregnated paper (including metallized paper tapes) includes 20 mils, at the conductor, of linen paper 0.8 mil thick. The purpose of this is to eliminate oil pockets in the region of maximum stress. Such construction made it possible to use the minimum size conductor and added to the ability of the cable to resist high-voltage surges.

Over the paper insulation is one 5-mil metallized paper tape and a 3-mil copper tape intercalated with a paper tape. In turn these are covered with two impregnated, 5-mil paper tapes as a bedding over which is extruded a permanent 60-mil polyethylene sheath. Over all is one 5-mil bronze tape lapped with intercalated polyethylene tape. Two D-shaped, brass skid wires are applied parallel with a helical lay of 8 in.

Each length of cable passed all tests required by the AEIC specifications for high-pressure, pipe-type cable (1951). A high-voltage, time-test cable sample withstood ten positive and ten negative impulses at 1,050,000 v prior to the specified AEIC 60-cycle tests which were withstood as follows: 284 kv to ground, 6 hr; 360 kv to ground, 3 hr; and 434 kv to ground, 3 hr.

The 8⅝-in. pipe, Grade A, electric welded with ¼-in. wall, in random 40 to 50-ft lengths, conformed to the API Std Specification 5L for line pipe.

Twenty G&W 230-kv potheads, including two spares, have been supplied for the installation. These are of the single high-strength porcelain tube design. Each porcelain met a routine internal pressure test of 500 psi for one hour.

## Square D Co to Build Plant in New Jersey

Square D Co has announced that it will definitely build an assembly plant in Secaucus, N. J. In addition, the company said, plans for the proposed Royal Oak, Mich., plant may be abandoned because of labor difficulties with the United Electrical Workers (Ind.) in the Detroit area.

The Secaucus plant, to be located on a 3½-acre site, will initially have 40,000-sq-ft assembly area costing $250,000. Final assembly plant will cost $700,000. Long-range plans include possible manufacturing facilities at the plant.

Plans for this plant, the company said, have been in the works for over two months and will be unaffected by expansion plans at Royal Oak. Proposed construction of the Royal Oak plant near Detroit (EW July 19, p 59) is being called off because of labor trouble.

Square D and the UE Local 957 have been unable to reach an agreement on the strike that has tied up the company's present Detroit plant since

June 16. Unless the differences can be solved the Detroit-area expansion will be abandoned, said L. W. Mercer, executive vice president. Square D has offered a 4¢-an-hour increase while UE is asking 15¢.

Other action by the electrical equipment manufacturer includes an unfair labor charge filed with the National Labor Relations Board against the UE Local 957, its business manager, and UE's Detroit representative. The complaint charges that the union "consistently failed and refused to bargain in good faith over the renewal of the labor contract which expired by its terms on May 16, 1954."

Complicating negotiations is a $210,000 suit filed by the company against UE, following two 7-day wildcat strikes some months ago.

Square D took an additional—and unusual—step: It began withholding union dues collected under a checkoff system, against the damages asked. The dues, amounting to about $3,000 a month, are being held in escrow. UE has filed suit, asking Wayne County Common Pleas Court to determine whether the company has the right to withhold dues which UE claims belong to it.

Square D insists that both parties, in a new contract, must agree that there will be no work stoppages. UE is equally adamant. It wants the company to agree never to file suit against the union.

UE, according to the company, has sanctioned 99 illegal walkouts during the last three years; in each of the three years, workers have lost 4% of their worktime—or about $190 a year—because of the walkouts; 103,000 man-hours were lost in 1951, said Square D; it was 90,000 man-hours in 1952; 86,000 in 1953; and for the first six months of this year, 62,000 manhours.

## Al Ass'n Develops Alloy Designations

A new four-digit index designation system for wrought aluminum and aluminum alloys becomes effective October 1, 1954. The system developed by The Aluminum Association is outlined with conversion tables in a booklet entitled "The Aluminum Association Alloy Designation System for Wrought Aluminum."

The new system is expected to meet all of the industry's present and future needs for wrought alloys. First digit of each designation indicates the general group to which a given alloy belongs. The last two digits identify the alloy or indicate the aluminum purity. The second digit indicates any modifications of the original alloy or impurity limits.

## Hubbard & Co Sold

All outstanding stock of Hubbard & Co has been purchased by Charles Dyson and associates. The company will continue to be independently operated. James H. Knowles will continue as president and become chief executive officer. Dyson will replace Joseph V. Smith who is retiring as chairman of the board.

## MANUFACTURING BRIEFS

**Chase Brass & Copper Co** will spend $5 million to expand and modernize its sheet mill production facilities at the East 260th Street Plant at Euclid, Ohio. Another $4 million will go to increasing copper and copper-alloy tube production at the Babbitt Road plant, also in Euclid.

## MANUFACTURERS' EARNINGS

| Company | Period Months Ended | | Net Income 1954 | Net Income 1953 | Common Share 1954 | Common Share 1953 |
|---|---|---|---|---|---|---|
| Allis Chalmers Mfg Co | 6 | June 30 | $13,490,505 | $10,453,368 | $3.94 | $3.33 |
| American Tel & Tel only | 3 | June 30 | 113,450,000 | 103,683,837 | 2.46(d) | 2.56(d) |
| American Tel & Tel only | 12 | June 30 | 440,230,000 | 388,541,062 | 10.16(d) | 10.09(d) |
| Brown Co | 28 wk | June 12 | $2,075,220 | $1,475,425 | $.... | $.... |
| Caterpillar Tractor Co | 5 | May 31 | 10,437,566 | 9,970,982 | 2.52(a) | 2.50(a) |
| Elliott Co | 6 | June 30 | 1,001,590 | 1,343,943 | 1.59 | 2.23 |
| Gould-National Batteries | 12 | April 30 | 2,718,026 | 3,167,259(b) | 3.75(c) | 4.46(c) |
| Kaiser Alum. & Chem. Corp | 3 | May 31 | 4,289,000 | 4,515,000 | 1.01 | 1.13 |
| Midwest Piping Co | 3 | May 31 | 397,223 | 554,470 | 0.51 | 0.71 |
| Monsanto Chemical Co | 6 | June 30 | 11,434,961 | 13,503,974 | 2.12 | 2.51 |

Note—(a) On shares outstanding at close of the period. (b) Includes special credit of $416,940. (c) Adjusted to reflect 100% stock dividend paid July 1, 1954. (d) Based on average number of shares outstanding during the period.

## MEETINGS CALENDAR

**Pan-American Federation of Engineering Societies**
(UPADI), Third Convention, Sao Paulo, Brazil, Aug. 2-12.

**Southeastern Electric Exchange**
Personnel Administration Section, Grove Park Inn, Asheville, N. C., Aug. 19-20; Engineering and Operation Section, Thomas Jefferson Hotel, Birmingham, Ala., Sept. 23-24; Accounting Section, Roanoke Hotel, Roanoke, Va., Oct. 21-22; General Sales Conference, Roosevelt Hotel, New Orleans, La., Oct. 28-30;

**International Electrotechnical Commission**
50th Anniversary Meeting, University of Pennsylvania, Philadelphia, Sept. 1-16.

**American Society of Mechanical Engineers**
Fall Meeting, Schroeder Hotel, Milwaukee, Sept. 8-10; Annual Meeting, Statler Hotel, New York, Nov. 28-Dec. 3.

**Rocky Mountain Electrical League**
Annual Fall Convention, Stanley Hotel, Estes Park, Colo., Sept. 12-15.

**Illuminating Engineering Society**
National Technical Conference, Chalfonte-Haddon Hall, Atlantic City, N. J., Sept. 13-17.

**Edison Electric Institute**
Accident Prevention Committee, Benjamin Franklin Hotel, Philadelphia, Sept. 20-21; Industrial Relations Committee, Round Table Conference, Palmer House, Chicago, Sept. 27-29; Prime Movers Committee, De Witt Clinton Hotel, Albany, N. Y., Oct. 4-5; Electrical Equipment Committee, Hotel Statler, Hartford, Conn., Oct. 11-12; Prime Movers Committee, Astor Hotel, New York, Nov. 29-30.

* **Missouri Valley Electric Association**
Accounting Conference, Jefferson Hotel, St. Louis, Mo., Sept. 23-24; Sales and Rural Conference, President Hotel, Kansas City, Mo., Oct. 6-8.

**American Institute of Electrical Engineers**
Committee on Petroleum, Conference on Electrical Applications in Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29; Middle Eastern District Meeting, Abraham Lincoln Hotel, Reading, Pa., Oct. 5-7; Fall General Meeting, Morrison Hotel, Chicago, Oct. 11-15.

* **International Association of Electrical Leagues**
Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 29-Oct. 2.

* **IRE Professional Group on Industrial Electronics**
Symposium, Mellon Institute, Pittsburgh, Pa., Sept. 29-30.

**National Electronics Conference**
10th Annual Conference, Hotel Sherman, Chicago, Oct. 4-6.

**National Association of Electrical Distributors**
Pacific Zone Convention, Mark Hopkins Hotel, San Francisco, Oct. 4-7.

**Pennsylvania Electric Association**
Fall Meeting, Systems Operation Committee, Alexander Hotel, Hagerstown, Md., Oct. 7-8; Fall Meeting, Relay Committee, Hotel Alexander, Hagerstown, Md., Oct. 14-15. Fall Meeting, Electrical Equipment Committee, Hotel Robert Treat, Newark, N. J., Oct. 19-20.

**Public Information Program**
Workshop Conference, Chase Park Plaza Hotel, St. Louis, Oct. 28-29.

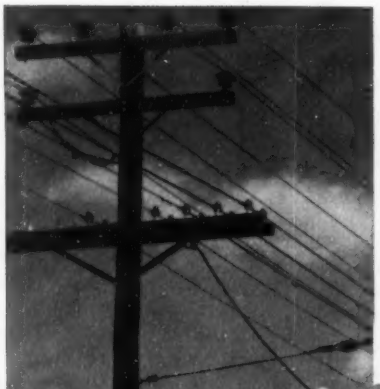
**National Electrical Manufacturers Association**
Haddon Hall Hotel, Atlantic City, N. J., Nov. 8-11.

**American Standards Association**
36th Annual Meeting and 5th National Conference on Standards, Hotel Roosevelt, New York, Nov. 15-17.

* **Additions this week.**

# Here's Proof of Performance...

## Pressure-creosoted poles used exclusively since 1929 with a replacement rate of less than 1%

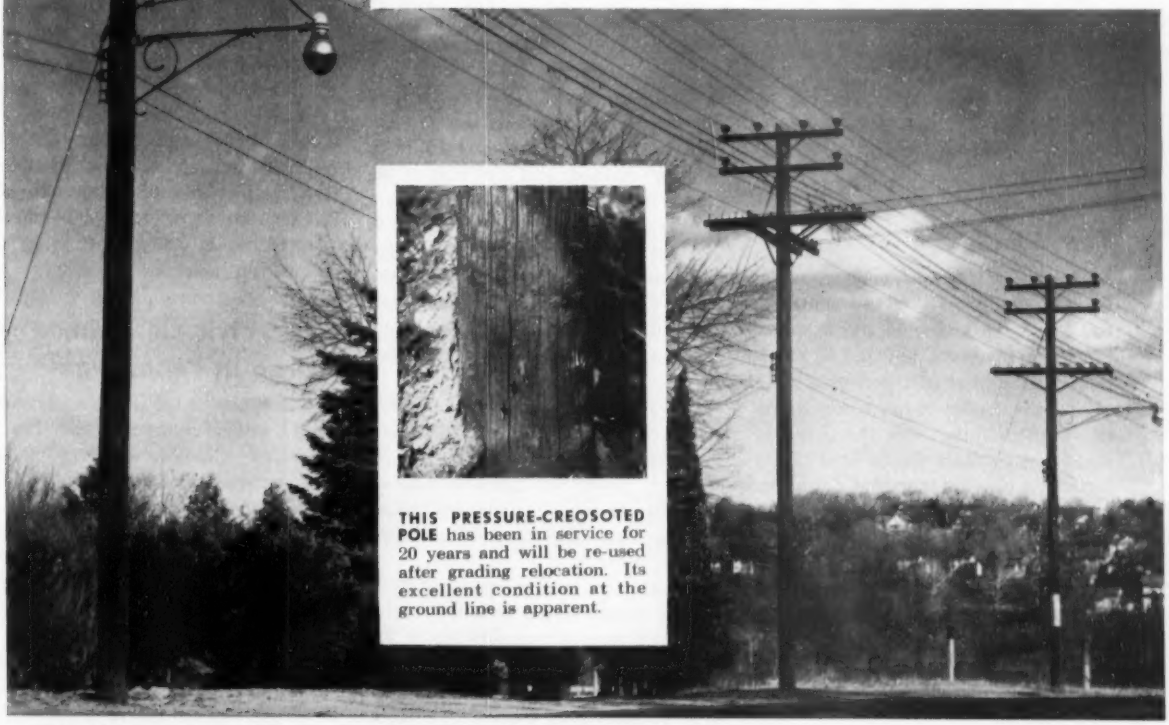


● A blight that affected native chestnut wood in 1927 turned a major Connecticut power company to the use of pressure-creosoted transmission line poles. The results were so satisfactory that the company has used nothing but pressure-creosoted poles since 1929.

Today, one of the company's operating divisions has 37,877 pressure-creosoted poles carrying 866 miles of overhead installations. Replacements, except for relocations have run less than one per cent.

Pressure-creosoted poles have proved themselves in actual service to be long-life poles. And you can count on top performance when USS Creosote is used in the treating process.

For complete information on USS Creosote, contact our nearest Coal Chemical sales office or write directly to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.



**THIS PRESSURE-CREOSOTED POLE** has been in service for 20 years and will be re-used after grading relocation. Its excellent condition at the ground line is apparent.

**THESE PRESSURE-CREOSOTED** Southern yellow pine poles have been in the ground at this location in Connecticut for 22 years. Not one pole has been lost to ground rot since installation.

**USS CREOSOTE**

4-1659

UNITED STATES STEEL

# Tax Law Shake-Up in the Making

The biggest tax law shake-up in history is about to go on the books, especially designed to do two things of prime importance to the utility industry:

1. Iron out inequities in the ways the tax laws work, the obvious gimmicks that just didn't make sense.

2. Design the tax laws to give businessmen incentives to keep the economy prosperous and growing. It's probably the first tax bill in history deliberately written to provide for expansion of the economy, rather than to provide revenue for the federal government.

Actually the 900-page tax reform results in substantial tax savings for many businesses, including utilities. Total savings written into the law come to about $1.4 billion.

But these savings are offset by the one provision that made the revision possible: A continuation of the corporate tax rate at 52% through next March 31—which will bring in an estimated $1.2 billion over the 47% rate which was to prevail beginning April 1 of this year.

## Two Main Incentives

There are two main incentive-to-business proposals—faster amortizative of plant and equipment and a break for investors designed to eliminate at least part of the double taxation of dividends. Faster amortization got through intact, but the dividend relief was cut back in the final bill to a fraction of what it started out to be.

Other tax changes affecting utilities include:

- A removal of the 2% penalty tax on consolidated returns filed by utility companies.

- A two instead of a one-year carryback of losses.

- A new rule giving companies greater freedom in accumulating reserves without paying a stiff penalty tax.

- A tougher rule on one company buying another to get the tax benefits of a record of losses.

- A step-up in due dates for corporate income taxes that will put companies more nearly on the same pay-as-you-go basis as individuals; and scores of others.

The new law on depreciation permits companies to take greater deductions on new plant and equipment bought after Jan. 1 of this year. For the past 20 years or so, the Treasury has favored the so-called straight-line method of depreciation which permits deduction as a cost the same percentage of the cost of a plant or equipment over the period of years shown by the Bureau of Internal Revenue as its "useful life." That is, the cost of a plant with a tax life of 20 years could be deducted only at 5% per year; a piece of machinery with a tax life of 10 years could be amortized at the rate of 10% a year.

Now, two new methods of writing off the cost of capital investment are permitted: The "double rate-declining balance" method, and the "sum of the digits" method. Both of these permit writing off two-thirds of the cost in half the useful life of the investment. Thus there's a big tax saving in the early years of the life of a new piece of capital equipment—but lesser deductions and hence a relatively higher tax liability in the later years.

For growing companies, particularly, there's no doubt of the tax advantages of faster amortization. It makes it easier for them to finance purchases of capital equipment, either through borrowing or out of their own funds.

In fact, the utility industry itself was the second largest industry receiving certificates of necessity under the Defense Production Act, entitling it to five-year tax deductions on about 45% of more than $4.1-billion worth of plant and equipment.

Dividend relief is the big thing that is still hanging up final approval. As the conference committee wrote it, taxpayers can deduct $50 of dividend income received in any year after July 1, 1954; for tax purposes, this much isn't taxable income. Then after figuring his tax bill, including as income the balance of his dividend income, the taxpayer is entitled to subtract from the final figure 4% of his dividend income received after Aug. 1, 1954, minus the $50. However, this dividend income credit may not be more than 2% of total taxable income in 1954 or more than 4% for later years. Democrats want to cut this relief still further.

## Consolidated Returns

On consolidated returns filed by utilities, the bill drops completely the 2% penalty tax and then eases the rule that permits companies to file such returns. Under the old law a company had to own at least 95% of the stock of the subsidiary. The new law permits filing of such returns when owning only 80% of such stock. The law sets out new rules on how the tax due from a consolidated return is to be allocated among the member-companies and thus show up on their profit and loss statements.

About 41 electric and gas utilities filing consolidated returns would be affected by the change.

## 14 Electric Companies Merge in Pennsylvania

Consolidation of 14 electric companies under common ownership in Crawford County in Pennsylvania was approved recently by the Public Utilities Commission.

The companies, controlled by Harley D. Carpenter, Meadville, will continue serving 4,477 consumers under present rates as the Carpenter Light & Power Co.

The utilities to go into the single corporate structure are: Cochranton Borough Electric Service; Conneaut Lake Borough Electric Service; Conneaut Lake Electric Light & Power Co; East Fairfield Township Crawford Public Service; East Fallowfield Light & Power; Fairfield Township Light & Power; Sparta Township Crawford Public Service; Union

Township Crawford Public Service; West Fallowfield Light & Power; Saegertown Borough Electric Service; North Shenango Electric Service; Spartansburg Borough Electric Service; South Shenango Electric Service, and West Shenango Electric Service.

Carpenter Light & Power will purchase all the properties and rights of each of the other 14 companies. In return, Carpenter will assume all the debts of the other firms and issue stock to each.

Creation of the single firm will eliminate duplicate administrative operations and result in economies, Carpenter said. It also will provide a capital structure "better suited to future financing," he added.

## Kwhr Sales Off . . .

### . . . but revenues hit a new high for first six months of 1954, Philadelphia Electric reports

Reflecting current economic conditions, kilowatthour sales by the Philadelphia Electric Co for the first six months of 1954 showed a decline for the first time in recent years, according to the company's half-year statement issued last week.

A decline in industrial demand caused the drop, but company officials said that this dip was virtually offset by increased demand from residential and commercial users. This enabled the company to set a record high for operating revenues and earnings.

Sales of electricity dipped to 4,684,786,000 kwhr in the first six months of 1954 from 4,688,253,000 in the comparable 1953 period.

However the importance of household and commercial use, in an area which is having a housing boom, was reflected in the fact that from July 1, 1953 to June 30, 1954, Philadelphia Electric's overall sales increased to 9,194,158,000 kwhr from 8,970,363,000 in the previous 12-month period.

Net income for the first six months of 1954 rose to $18,438,032, or $1.49 a common share, from $17,538,371, or $1.45 a share on fewer shares a year earlier.

Consolidated earnings available for common stock totaled $26,210,009 for the 12 months ended June 30, 1954. This is equivalent to $2.41 a share.

# Today in Utility Finance

## YIELDS (%)

| Quality... | Bonds | | | Preferred Stocks | | | Common Stocks | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 1st | 2nd | 3rd | 1st | 2nd | 3rd |
| DATE | | | | | | | | | |
| **July 22** | **2.87** | **2.92** | **3.16** | **3.99** | **4.10** | **4.44** | **4.49** | **4.75** | **5.18** |
| July 15 | 2.88 | 2.94 | 3.16 | 4.00 | 4.11 | 4.44 | 4.57 | 4.81 | 5.26 |
| END OF QTR. | | | | | | | | | |
| 2nd 1954 | 2.90 | 2.96 | 3.19 | 4.03 | 4.14 | 4.48 | 4.72 | 5.04 | 5.45 |
| 1st 1954 | 2.82 | 2.87 | 3.14 | 3.88 | 4.09 | 4.42 | 4.83 | 5.19 | 5.42 |
| 4th 1953 | 3.07 | 3.12 | 3.34 | 4.17 | 4.32 | 4.62 | 5.07 | 5.57 | 5.51 |
| 3rd 1953 | 3.30 | 3.33 | 3.54 | 4.35 | 4.52 | 4.83 | 5.36 | 5.97 | 6.01 |

Data: Reis & Chandler, Inc.

## EARNINGS

| Company | Period Months Ended | | Net Income 1954 | Net Income 1953 | Earnings Per Common Share 1954 | Earnings Per Common Share 1953 |
|---|---|---|---|---|---|---|
| Alabama Power | 12 | June | $12,953,983 | $12,220,683 | $.... | $.... |
| Arkansas Power & Light | 12 | June | 6,252,815 | 5,929,834 | .... | .... |
| Carolina Power & Light | 12 | June | 7,581,043 | 7,199,365 | .... | .... |
| Central Vermont Public Service, consolidated | 12 | June | 1,100,247 | 1,001,265 | .99(a) | 1.06(a) |
| Consolidated Edison Co of N. Y., consolidated | 12 | June | 48,671,756 | 49,856,424 | 2.86(b) | 2.97(b) |
| Detroit Edison | 12 | June | 20,858,639 | 19,978,473 | 1.94(c) | 1.89(c) |
| Georgia Power | 12 | June | 13,024,246 | 12,090,562 | .... | .... |
| Houston Lighting & Power | 12 | June | 11,150,011 | 9,766,409 | 2.04(f) | 1.97(f) |
| Iowa Southern Utilities | 12 | June | 1,193,032 | 1,343,983 | 1.43(g) | 1.92(g) |
| Louisiana Power & Light | 12 | June | 3,652,816 | 3,341,574 | .... | .... |
| Minnesota Power & Light | 12 | June | 3,727,018 | 3,800,287 | 1.83(h) | 1.88(h) |
| New York State Electric & Gas | 12 | June | 9,607,986 | 8,097,303 | 2.69(i) | 2.57(i) |
| Oklahoma Gas & Electric | 12 | June | 5,841,227 | 6,008,181 | 1.80 | 1.93 |
| Portland General Electric | 12 | June | 4,048,470 | 3,634,970 | 1.35(j) | 1.21(j) |
| Public Service of Oklahoma | 12 | June | 5,710,462 | 5,240,172 | .... | .... |
| San Diego Gas & Electric | 12 | May | 5,017,113 | 4,526,883 | .... | .... |
| Southern Co, consolidated | 12 | June | 22,097,148 | 21,042,848 | 1.22 | 1.16 |

Notes—(a) Based on 867,141 shares in 1954 and 762,300 shares in 1953; (b) Based on 13,670,711 shares in 1954 and 13,581,863 shares in 1953; (c) Based on shares outstanding at end of period; (f) Based on shares outstanding at close of respective periods; (g) Based on 742,551 shares in 1954 and 619,815 shares in 1953; (h) Based on 1,716,094 shares outstanding in 1954; (I) Based on 3,034,068 shares in 1954 and 2,696,950 shares in 1953, and (j) The 1953 figures have been revised to give effect to the 2-for-1 stock split, effective as of the close of business on April 22, 1954.

## FINANCIAL

| Company and Description | Amount of Offering (000) | Offering Price | Yield to Public |
|---|---|---|---|
| WEEK OF JULY 22-28 | | | |
| **Bonds** | | | |
| Boston Edison—1st mtg 3% due 1984 | $18,000 | 101.19% | 2.94% |
| SCHEDULED FOR AUGUST—SEPTEMBER—OCTOBER | | | **Bid Date** |
| **Bonds** | | | |
| Pacific Power & Light—1st mtg due 1984 | $30,000 | ..... | Aug. 9 |
| Metropolitan Edison—1st mtg due 1984 | 3,000 | ..... | Aug. 15 |
| Manitowoc, Wis.—electric revenues | 1,250 | ..... | Aug. 16 |
| New Jersey Power & Light—1st mtg due 1984 | 8,700 | ..... | Aug. 17 |
| Southern California Edison—1st mtg | 30,000 | ..... | Aug. 18 |
| Niagara Mohawk Power—1st mtg due 1984 | 25,000 | ..... | Aug. 24 |
| Arkansas Power & Light—1st mtg due 1984 | 7,500 | ..... | Aug. 24 |
| Los Angeles, Calif., Department of Water & Power—electric revenues | 19,500 | ..... | Sept. 8 |
| Northern States Power (Minn.)—1st mtg due 1984 | 20,000 | ..... | Sept. 28 |
| Indiana & Michigan Electric—1st mtg | 16,500 | ..... | Oct. 5 |
| **Preferred Stock** | | | |
| Oklahoma Gas & Electric—75,000 sh $100 par | 7,500 | ..... | Sept. 14 |
| Indiana & Michigan Electric—40,000 sh $100 par | 4,000 | ..... | Oct. 5 |
| Southern Colorado Power—30,000 sh 4.72% $50 par | 1,500 | ..... | .....(f) |
| Atlantic City Electric—72,000 sh $100 par | 7,200 | ..... | .....(g) |
| ISSUES RECENTLY POSTPONED | | | |
| **Bonds** | | | |
| Gulf States Utilities—1st mtg due 1984 | $24,000 | ..... | ..... |
| Consolidated Edison Co of N. Y.—1st mtg due 1984 | 50,000 | ..... | ..... |
| **Preferred Stock** | | | |
| Missouri Public Service—50,000 sh $100 par | $5,000 | ..... | .....(a) |
| California Electric Power—105,000 sh $50 par | 5,250 | ..... | .....(b) |
| Gulf States Utilities—160,000 sh $100 par | 16,000 | ..... | ..... |
| UNSCHEDULED, AND/OR UNDER CONSIDERATION | | | |
| **Bonds and Debentures** | | | |
| Long Island Lighting—1st mtg | $20,000 | ..... | ..... |
| Central Hudson Gas & Electric—1st mtg | 10,000 | ..... | ..... |
| Rockland Light & Power—debs due 1974 | 10,000 | ..... | .....(c) |
| Montana-Dakota Utilities—1st mtg | 12,000 | ..... | ..... |
| **Preferred Stock** | | | |
| Rockland Light & Power | $4,000 | ..... | .....(c) |
| Northern States Power (Minn.) | 20,000 | ..... | ..... |
| Central Hudson Gas & Electric—80,000 sh | ..... | ..... | ..... |

Notes—(a) Postponed indefinitely; Kidder Peabody & Co, underwriters; (b) Temporarily postponed; Merrill Lynch, Pierce, Fenner & Beane group, underwriters; (c) To be sold privately; (f) Stone & Webster Securities Corp group, underwriters, and (g) Probably be sold privately through Union Securities Corp group.

# ICC Awards Rate Hike . . .

**. . . of $4,430,000 a year to Illinois Power Co for its electric service. Utility had requested $4,630,000 annually**

Illinois Commerce Commission, acting on a petition of the Illinois Power Co, granted $4,430,000 of the $4,630,000 originally requested (96%) for electric increase, but allowed only 39% of the requested increase for gas. The total reduction in electric, gas and steam rates, as originally proposed by the company, was from $7,280,000 to $5,398,000. The date of the order was July 6.

With respect to the evidences of value, the ICC found that net original cost for the electric plant amounted to $182,417,331. The major adjustment to original cost made by the commission at the suggestion of its own witness, amounted to only $1,-265,702.

With regard to reproduction cost new less observed depreciation of the company's electric plant, the commission found that to be $246,516,398 exclusive of materials and supplies and cash working capital. The ICC stated that "Alfred P. Learned for the company testified in April, 1954, that reproduction cost prices of the electric plant had increased 6% over the level of the average prices for the year 1952 and that the corresponding increase in prices of the gas utility plant was 9%. The company has not requested any increase in the reproduction cost figures by virtue of the increase of price levels over and above the average price level for the year 1952 on which reproduction cost appraisals in this proceeding have been based."

## Depreciation Compared

The order continued: "The commission has tested the company's depreciation accounting by comparing the per cent of the total depreciation of the used and useful electric plant charged on the books of the company, which is 12.9% as at Sept. 30, 1953, with the per cent observed depreciation, including obsolescence and other factors employed by the company's witnesses in arriving at reproduction cost new depreciated. The latter per cent is 16.3% as at Sept. 30, 1953. The results are within a tolerance area which, under the circumstances of this case, the commission should accept."

As to working capital, the order said "The company takes the position that the total amount of its working capital requirements is approximately $16,000,000 and that a little over $5,000,000 is offset by the accumulated reserves for taxes."

## Fair Value Fixed

While the intervenors contended that only materials and supplies in the amount of $7,200,000 be allowed, the ICC found working capital should be $10,790,000 for both the electric and gas departments.

As to the determination of the rate base, the ICC said "Upon consideration of all of the evidence in the record with respect to fair value, we hereinafter find that the fair value of the company's property used and useful in rendering service in its electric utility is $210,000,000; . . ."

Significantly, the order stated "We make no finding of rate base for the steam heat utility for, as subsequently stated, the company seeks steam heat rates which will provide only for operating expenses."

The above rate base is inclusive of working capital in the amount of $8,-800,000 applicable to electric operations.

The fair value rate base is 10% over the net original cost rate base, approximately equal to gross cost of plant in service and 15% less than reproduction cost new less observed depreciation.

As to the rate of return, the ICC said in its order "In determining the fair and reasonable rate of return to be applied to the electric and gas utility rate bases the commission has considered among other elements those relating to current economic conditions and the earnings for investments having similar risks, and hereinafter find that the fair rate of return for the company's electric utility is 5.8% and for the company's gas utility is 5.95%.

"Three witnesses testified on the subject of rate of return: Dr J. Rhoads Foster and Marvin Chandler for the company and Dr Lionel Thatcher . . . Dr Foster estimated the fair rate of return for the business of the electric utility at 5.85% and the fair rate of return for the business of the gas utility at 6.35%, such rates of return to be applied to a rate base reflecting the changes in price levels and current economic conditions. Chandler estimated the fair rate of return for the business of the electric utility at 6% and for the business of the gas utility at 6.5%. Dr Thatcher limited his study to the fair rate of return to be applied to the fair value rate base of the electric utility. He found 5.6% as the fair rate of return."

It is of interest to note, in this connection, that the order said "The company has not requested any return on its steam heating property in this proceeding and the commission is not, therefore, making any findings with respect to a fair return on the fair value of such property."

## Tacoma City Council Amends Rate Schedule

The Tacoma, Wash. City Council has approved an amended City Light rate schedule to meet protests made against the former schedule by appliance dealers and residents using space heaters.

The new residential rate provides that all electric power used over 430 kwhr will cost an additional mill or 6 mills a kwhr. In addition, the average monthly consumption of the consumer will be determined from the four monthly billing periods immediately preceding Oct. 15 of each year, with the consumer to be charged 2 mills more a kwhr for all power used over 1.75 times the average monthly consumption established.

The amended rate schedule has provision for an adjustment of individual consumption schedules for additional load caused by the purchase of a new appliance.

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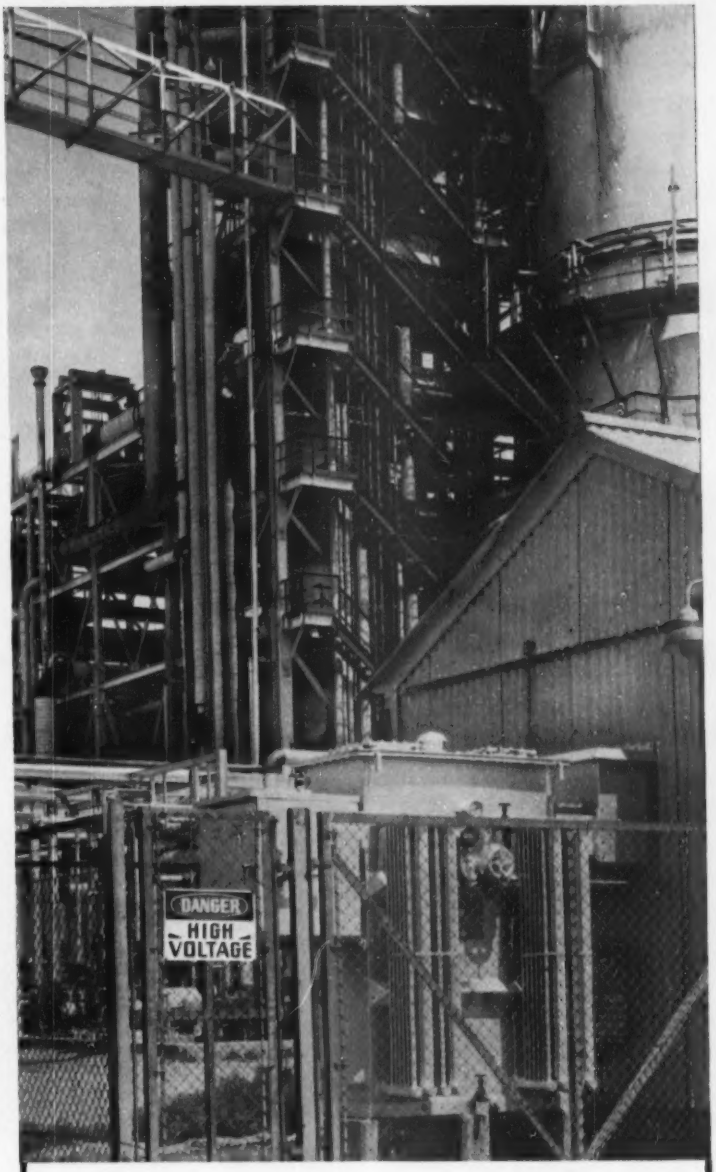


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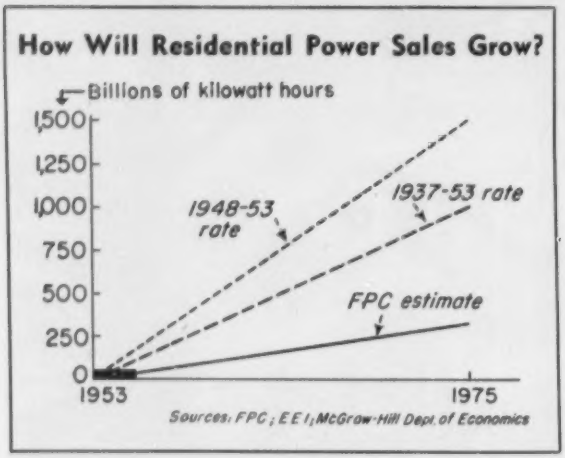
# ELECTRICAL BUSINESS OUTLOOK




## FPC Says Energy Sales to Rise 209% by '75

One of the more popular statistical indoor sports—estimating future U. S. power requirements—got a new boost last month from the Federal Power Commission. The commission is now a full fledged entrant, with estimates stretching as far into the future as 1975.

FPC expects electric energy requirements for Class I utilities to grow by 209% in the next 22 years, to about 1,356 kwhr in 1975. Here's the way estimates break down:

| Kilowatthour Use (Billions) | 1953 | 1975 |
|---|---|---|
| Farm (Excluding irrigation & drainage pumping) | 14 | 46 |
| Irrigation and drainage pumping | 6 | 10 |
| Nonfarm residential | 83 | 277 |
| Commercial | 69 | 203 |
| Industrial | 196 | 615 |
| Other deliveries | 20 | 44 |
| Lost and unaccounted for | 51 | 161 |
| | 439 | 1,356 |

FPC also estimated future energy requirements and peak loads for the FPC regions. See the table accompanying story in Electrical World (July 26, p 100).

Aside from regional details of interest to special groups, perhaps two points stand out about the FPC estimates. One is the overall rate of growth assumed for electric energy requirement; the other is the relative rate of growth of different uses of electric power.

**FPC Expects Power Slowdown . . .** FPC expects power needs to grow at a substantially slower rate in the future. Generation of Class I utilities grew by about 9.6% a year during the period, 1948-53. FPC expects the average rate of growth to be down around 3.6% a year by the last five years of its forecast period—1970-75.

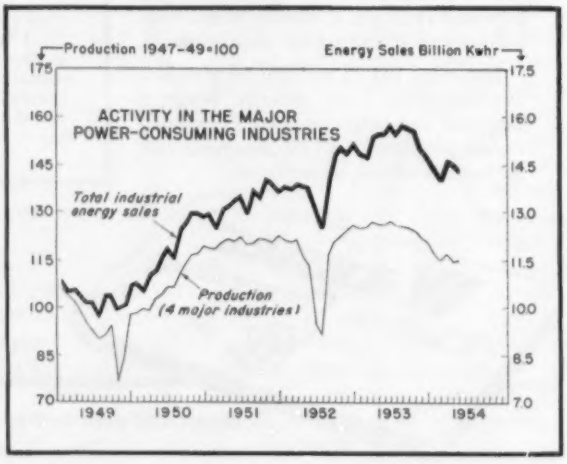
It is certainly reasonable to expect some decline in the rate of utility growth, especially from usual rates of recent years. But the drop FPC expects is really striking. If FPC is correct, electric utilities will be growing only slightly faster, by 1975, than the economy as a whole; the long run growth rate in total output of goods and services has been slightly more than 2.75% per year.

Growth of 3.6% a year in 1970-75 would mean substantial annual additions to utility plant—about 10 million kw per year. This, says FPC, indicates that the country will continue to be very prosperous. However, it may not seem so to producers of generating equipment, who have been turning out 10-14 million kw of equipment a year—and looking forward to growth in the not-too-distant future.

**Projected Growth Surprising . . .** Projected rates of growth in the various classes of electric energy use are also somewhat surprising. FPC expects all classes of use to hold roughly the same share of total generation in 1975 as they do today. There are some slight variations—residential is expected to grow slightly faster than the total, "other deliveries" somewhat slower. But the change expected in each share is quite small.

This projection is particularly interesting as it applies to the residential sector. A good many utilities have been counting on rapid growth of profitable residential sales as a source of added revenue in the future (see chart accompanying recent growth rates which show the 1975 FPC estimate).

Electrical World's last forecast issue (Sept. 21, 1953) estimated that residential sales would be 29.6% of total sales by 1963, compared to 25.3% last year and 15.4% ten years earlier. Gains should be even greater after 1965, as the record mass of children born in recent years gets married and forms new households. But the FPC expects the residential share of electric use to rise by less than 2% of the total.



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